

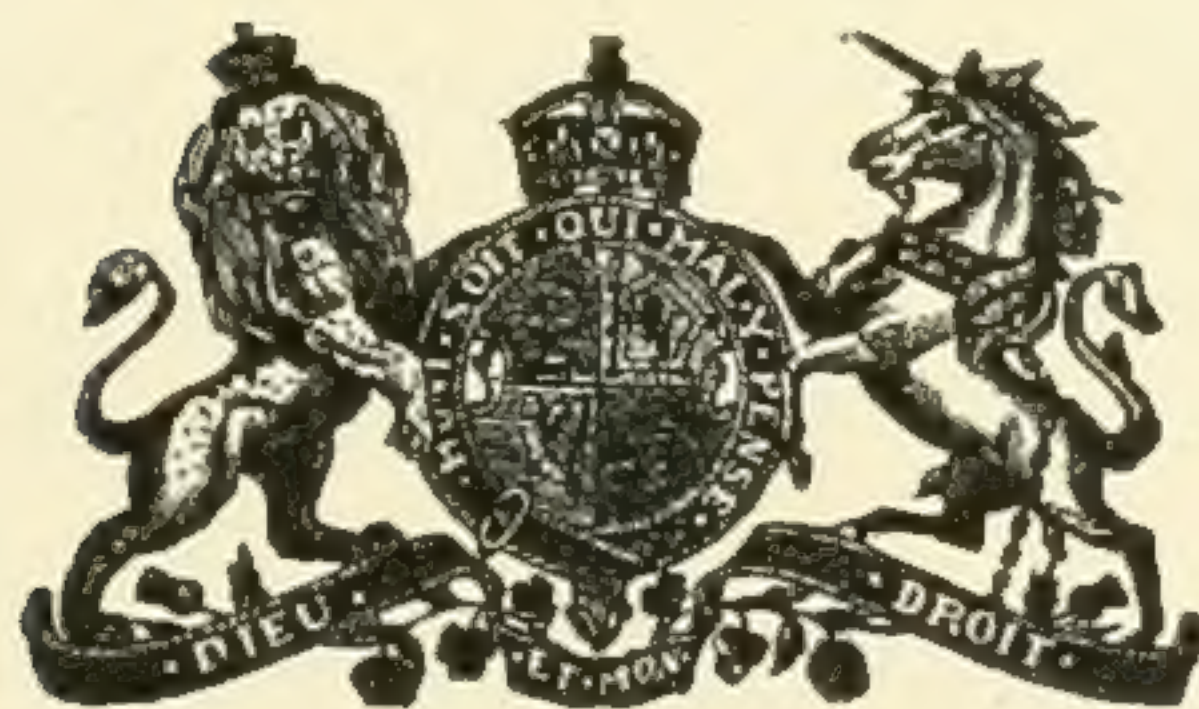
DEPARTMENT OF AGRICULTURE  
CANADA.

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REPORT  
OF THE  
VETERINARY DIRECTOR GENERAL  
AND  
LIVE STOCK COMMISSIONER  
J. G. RUTHERFORD

For the Year ending March 31, 1909

*PRINTED BY ORDER OF PARLIAMENT*



OTTAWA

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EXCELLENT MAJESTY

1911

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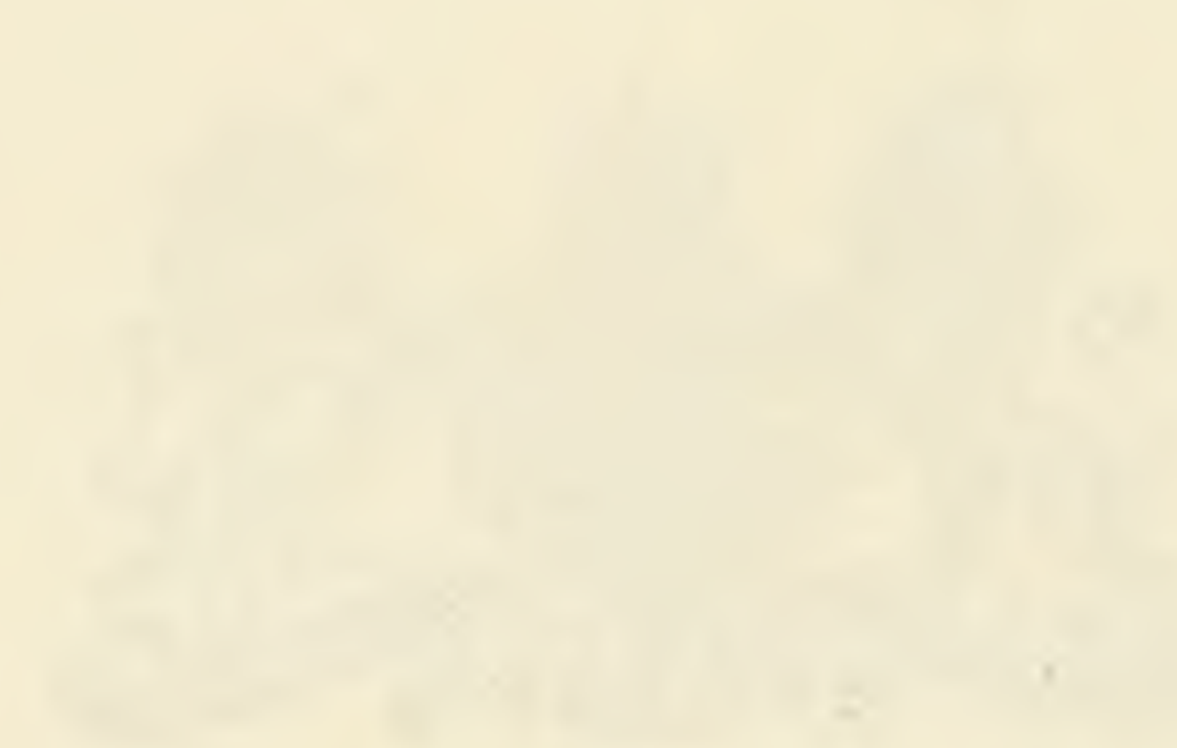
# LETTERS TO THE BISHOP OF BATH

AND  
A  
SERMON

PREACHED AT  
BATH

ON THE  
SUNDAY AFTER TRINITY

BY  
THE  
REV. J. H. BISHOP



PRINTED BY  
J. H. BISHOP



## REPORT OF THE VETERINARY DIRECTOR GENERAL AND LIVE STOCK COMMISSIONER.

HEALTH OF ANIMALS AND LIVE STOCK BRANCHES.

OTTAWA, March 31, 1909.

SIR,—I have the honour to present my annual report as Veterinary Director General and Live Stock Commissioner for the year ending March 31, 1909:—

### HEALTH OF ANIMALS.

Although fortunately no serious outbreak of disease has, during the past year occurred in the Dominion, the officers of this Branch have, nevertheless, been kept busily engaged not only in the performance of their regular duties, but in safeguarding the live stock of the country from what has been perhaps, the most grave danger which has ever threatened it.

The recent serious outbreak of foot and mouth disease in the United States, and especially in those portions of New York and Michigan which lie in immediate proximity to the Canadian frontier, created a situation undoubtedly more dangerous to our live stock industry than any previously experienced in the history of the country. It is therefore, especially in view of the highly contagious nature of this disease and the fact that it is very readily transmissible by many indirect channels, a matter for congratulation that the officers of this Branch were successful, by the adoption of the most stringent quarantine measures and unremitting efforts in their enforcement, to entirely prevent its introduction to the Dominion.

When it is remembered that the disease existed in the cities of Detroit, Michigan, and Buffalo, New York, as well as in the country surrounding these centres, and that one very serious outbreak occurred on Grand island, in the Niagara river, the efficiency of our quarantine service must, I think, be recognized and duly appreciated.

I may add that these gratifying results could not possibly have been secured but for the existence of the efficient veterinary sanitary service, to the creation of which much strenuous effort has been devoted during recent years.

The existence of the disease in the State of Pennsylvania was first reported to the British authorities during my second visit to Rome as the Canadian delegate of the International Institute of Agriculture. Fortunately I was at this time in close touch with the British delegate, Sir Thomas Elliott, the official head of the British Board of Agriculture and Fisheries, who naturally was kept fully informed by wire from London of everything which was taking place.

You will recollect that the first reports indicated Toronto as the original place of origin of the infection on this continent, and it was only because I was able to disprove this statement and to promise absolute safety as regards the health of Canadian cattle that our export trade with Great Britain was permitted to continue.

In order, however, to secure this concession it was necessary to allay the anxiety of the British authorities by agreeing to make a close farm to farm inspection of all the territory in Ontario which might be considered as tributary to Buffalo and Detroit.

Full instructions with regard to the enforcement of quarantine and the disposition of our inspection staff were cabled by me from Rome, and it is difficult to speak



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too highly of the energetic and effective manner in which these instructions were carried out by Dr. Hilton and the other officers of the Branch.

As soon as the facts became known the entry to Canada of live stock of any kind which had originated or passed through the States of New York, Michigan, Pennsylvania, New Jersey, Maryland, and Delaware, was strictly prohibited, as was also that of hay, straw, or other fodder or manure from these states.

These restrictions have been gradually modified as the disease has been brought under control by the United States authorities, and it will in all probability be quite safe to abrogate them entirely in the near future.

In order to avoid all possibility of suspicion being attached to Canadian cattle, their shipment from United States ports or on vessels which had, within twenty-one days previous, called at any port in an infected State, was entirely forbidden. Vessels carrying United States cattle from ports on the Atlantic coast were also prohibited from entering Canadian ports. These restrictions have now been revoked.

The policy of slaughter and compensation adopted by the United States authorities was undoubtedly well advised, as had the methods formerly in vogue been proceeded with, the disease would almost certainly, under modern conditions of transportation, have spread rapidly over the country, in which event it would have been practically impossible to prevent its introduction sooner or later to the Dominion. It is safe to say that never in the history of veterinary sanitation has so serious and widespread an outbreak of a highly infectious disease been dealt with so speedily and effectively as in this instance.

### GLANDERS.

Successful results continue to attend our campaign against glanders, and the indications are that with the present policy it will only be a comparatively short time until this disease is under absolute control.

The number of horses submitted to the mallein test during the year was very much greater than ever before, although the number of those destroyed has diminished by 343 head, while the expenditure in compensation is nearly thirty thousand dollars (\$30,000) less.

The disease is still occasionally introduced by horses from the United States, but the present policy under which all horses unaccompanied by satisfactory mallein test charts signed by the officers of the United States Bureau of Animal Industry are tested by our inspectors at the boundary, is certain to greatly reduce this danger in future.

During the rush season of immigration which occurs every spring great difficulty is experienced in enforcing this policy in such a manner as to make it effective without at the same time seriously delaying incoming settlers at boundary points. The numbers arriving are occasionally so large as to make it impossible to detain them all, and a certain proportion of horses are therefore almost perforce, permitted to proceed to destination points to be tested after their arrival there. Such horses are followed up and tested as soon as possible, but as settlers not unfrequently change their original locations there is in this condition a certain element of risk, which I hope to be able to eliminate in the near future.

In the Eastern Provinces and in British Columbia the disease is apparently under satisfactory control, while great improvement also is noticeable in Manitoba. In Saskatchewan, however, and to a less extent in Alberta, there is still much energetic work to be done before the results can be regarded as entirely satisfactory.

### MANGE.

It has been found necessary to alter materially the policy of the Branch in dealing with mange among cattle in that portion of Alberta and Saskatchewan where this disease exists. Through the enforcement during recent years of compulsory dipping



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orders covering the whole area under the restriction, many districts have been entirely cleaned up. Owners in such districts naturally object to being compelled to dip their healthy herds, and after consultation with the stock men, it was deemed advisable to substitute for the policy of compulsory treatment of cattle within the area, one of close inspection and the adoption of prompt and energetic measures in regard to all animals found to be affected, as well as all contact cattle. While the disease is by no means entirely eradicated it is under better control than at any time since its introduction from the United States fifteen years ago.

## DOURINE.

Cases of dourine or *maladie du coit* are still occasionally discovered in the horse breeding districts in Southern Alberta and South-western Saskatchewan. This disease is of an insidious and erratic character, and from the great difficulty attending its diagnosis, is exceedingly hard to detect especially in mild or incipient cases. A close watch is, however, being kept over the breeding operations in the districts where it has been found, and every suspected animal is quarantined and kept under close observation, while those in which the symptoms are sufficiently well marked are promptly destroyed. No horses are allowed to be moved from the infected area without first undergoing a careful veterinary examination, and this precaution has apparently been effective in preventing its introduction into other districts.

The branch laboratory in connection with the quarantine station at Lethbridge, Alberta, is still being maintained for the purpose of continuing research work with the object of discovering either a curative agent, an effective prophylactic, or a reliable means of diagnosis.

Although much earnest effort has been bestowed on this work by Dr. Watson, the officer in charge, no definite results have been secured since the identification last year of the specific causal agent, the *trypanosoma equiperdum* then discovered for the first time on this continent. The various reports of Dr. Watson covering his work in relation to this and other diseases, which are printed as an appendix to this report, will be found most interesting.

## REDWATER.

During the past year Dr. Thomas Bowhill, F.R.C.V.S., a veterinary pathologist of high standing, has been engaged in investigating the nature of the disease known as redwater, which has, ever since settlement took place, been responsible for serious losses among cattle in some few districts in British Columbia.

As a rule maladies of this class are due to the presence in the blood of a specific parasite generally transmitted through the bite of some species of tick. These ticks infest the skin of the animal and act as intermediary hosts to the blood parasite which causes the disease.

Dr. Bowhill is of opinion that the causal agent of the redwater seen in British Columbia is a blood parasite transmitted in the manner described above, but the proofs so far obtained are not sufficiently definite to warrant any official action based on this hypothesis. The investigation will be continued until the nature of the disease is satisfactorily demonstrated.

## HOG CHOLERA.

I am pleased to be able to report that, although several isolated outbreaks of hog cholera took place in Ontario during last summer, those districts in the western peninsula of that province, where the disease was at one time firmly established, have been entirely freed from infection. Except in one case, where the origin of the outbreak could not be ascertained, the cases which have occurred in Ontario are directly traceable to the transit trade in United States hogs.



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A few cases have occurred in British Columbia, but in these also the infection was undoubtedly brought in from the United States.

The compensation paid on account of hog cholera is slightly larger than it has been for some years back, the increase being due to the fact that the herds affected were much larger than in ordinary cases, and that one of them was composed altogether of valuable pure bred animals.

### SHEEP SCAB.

A few outbreaks of sheep scab were discovered and dealt with early in the year but the disease was in all cases very limited, and, as a result of the energetic measures adopted, was stamped out with comparative ease.

Everything possible has been done in the way of tracing up and subjecting to treatment all sheep known or suspected to be in contact with the diseased animals, but, with the exception of one small flock in the county of Simcoe, which is still being held for treatment, no further cases have been discovered.

### RABIES.

I regret to have to report that several outbreaks of rabies have occurred in the province of Ontario during the past year, and that not only dogs but a number of other animals have been affected. Several human beings were also bitten, but the prompt adoption of the Pasteur treatment has been successful in arresting the progress of the malady in several instances, no fatal human cases having been reported.

The disease undoubtedly was introduced from the State of New York, where it has existed for many years, and where it has been of late even more than usually prevalent.

Rabies first made its appearance in Ontario nearly two years ago, being traced to a dog which crossed the Niagara river at the Suspension Bridge, bit several animals owned in Queenston, Ontario, and returned to the United States without having aroused suspicion of its being affected. Somewhat later an outbreak at Red Deer, Alberta, was traced to a dog taken from Hamilton, Ontario, where the existence of the disease was discovered a short time afterwards. The infection is unquestionably spreading throughout the western peninsula of Ontario, and it will probably be necessary in the near future to insist on the muzzling, or detention, of all dogs within the area in which the disease is known to exist in order to prevent its extension throughout the Dominion.

By the enforcement of strict muzzling orders, and the adoption of an inflexible regulation requiring the isolation for six months of all dogs imported, rabies has been entirely eradicated from Great Britain. While in view of our lengthy land boundary, easily crossed not only by dogs, but by wild animals as well, it is practically out of the question to establish an effective quarantine against the United States, it should, I think, be possible to control the present outbreak by enforcing strict muzzling regulations and prohibiting the movement of dogs from the infected district.

### ANTHRAX.

Occasional outbreaks of anthrax have been reported from various localities, but none of these have been of an extensive character.

The system of preventive inoculation now generally adopted is apparently proving successful in controlling the ravages of this most malignant disease. Vaccines for anthrax and black-quarter prepared in the Biological Laboratory of this branch are playing an important part in the control of this disease. These vaccines are supplied to the public at the nominal price of five cents per dose, and although the



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demand for anthrax vaccine is fortunately very limited, the vaccine for black-quarter is sent out in large quantities, especially to those districts where that troublesome malady has until recently been prevalent.

The valuable privilege which the stock owners of the country enjoy in being able to obtain reliable vaccine at a nominal price, is evidently appreciated, if one may judge by the number of doses sent out.

## BIOLOGICAL LABORATORY.

The Biological Laboratory is also to be credited with a considerable annual saving to the department through the manufacture of mallein and tuberculin. The large quantities of these preparations now required in the work of the branch would, if purchased from dealers, necessitate a very considerable annual expenditure, while their reliability would be much less certain than at present. The public also derive much benefit from the use of reliable preparations by our officers in testing horses and cattle, as also from the reports furnished in regard to pathological specimens forwarded to the laboratory for diagnostic purposes.

## TUBERCULOSIS.

In regard to bovine tuberculosis there is little new to report. The control of this disease is undoubtedly the most serious problem now confronting governmental authorities throughout the world. Although every phase of the subject has been carefully and consistently studied by the most highly trained and skillful scientists of every civilized country, no policy at once practical and effective has yet been promulgated.

At the International Congress on Tuberculosis held in Washington, D.C., September 28th, to October 5th, 1908, one section was specially devoted to bovine tuberculosis, but while many interesting papers were contributed, no definite conclusion was arrived at.

Under modern conditions, as regards the exchange and transportation of live stock, the disease is rapidly extending, and it goes without saying that action in the direction of securing its effective control and ultimate eradication will, ere long, be found absolutely necessary. I trust that in the near future it may be found possible to devise some means of securing a definite joint pronouncement in favour of a sound and sensible policy, which may be adopted by governmental authorities, with reasonable hope of success.

The open air treatment with bovine tuberculosis, referred to in previous reports as having been in progress since December, 1905, has now been finished, and a full report of the results in detail is published herewith. The objects of this experiment, which was purely of a practical nature, were three fold: firstly, to ascertain the effect of open air treatment on the diseased cattle themselves; secondly, to ascertain to what extent healthy cattle kept in contact with diseased cattle under open air conditions, are subject to infection; thirdly, to ascertain what percentage of healthy calves it is possible to rear from diseased cows kept without any precautions under open air conditions.

The data obtained indicate that open air life is highly beneficial to tuberculous cattle and that the danger of transmission to adult cattle kept in contact under these conditions is relatively slight. On the other hand, the percentage of healthy calves raised by the diseased cows is, as was to be expected, comparatively small.

## QUARANTINE.

The old quarantine station at Point Edward has, since the construction of the Sarnia Tunnel, been found to be very inconvenient on account of its distance from the point at which animals entering Canada cross the St. Clair river. The lease of



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this property has, therefore, been cancelled and the buildings disposed of to the best advantage. Much of the material has been utilized in the construction of new and more convenient quarantine buildings in close proximity to the Tunnel station.

A quarantine station has been established at Big Muddy, Sask., while the following places have been added to the list of inspection stations:—

Edmundston, New Brunswick,  
Aroostook, New Brunswick,  
Debec, New Brunswick,  
St. Leonards, New Brunswick,  
Stanstead, Quebec.

### STAFF.

The following changes in the personnel and disposition of the staff have taken place during the year just past:—

On May 1, it was found necessary to recall to head office, Dr. Hilton, who had been since June, 1907, stationed at Regina engaged in organizing the Field Inspection Service of the Branch in Saskatchewan and Alberta.

The work in Saskatchewan was placed in charge of Dr. A. G. Hopkins, while at the same time Dr. J. C. Hargrave was appointed Chief Veterinary Inspector for Alberta, with headquarters at Medicine Hat.

With the coming into force of the Civil Service Amendment Act on September 1, 1908, Dr. Hilton became Chief Veterinary Inspector, while Dr. Moore received the rank of Chief Travelling Inspector.

In Saskatchewan Dr. W. H. Mustard, Dr. A. G. Acres and Dr. G. H. Cottrill were appointed as veterinary inspectors, and the resignation of veterinary inspector Mitchell of North Portal was regretfully accepted.

In Alberta Dr. V. V. Christie was appointed a veterinary inspector, and located at Twin Lakes, and Mr. T. M. Morgan was engaged as a travelling inspector in the mangle infected area.

In Manitoba Dr. J. B. Still was appointed a veterinary inspector under Dr. C. D. McGilvray.

Dr. William Lawson of the Rainy River district being transferred to the Meat Inspection Division of the service, Dr. A. McTaggart was appointed boundary inspector in his stead. The resignation of Dr. W. Laidlaw, an assistant pathologist at the Biological Laboratory of the Branch, was accepted on March 27, 1909.

In May, 1908, Dr. S. H. Ward having been offered re-engagement as secretary of the Live Stock Sanitary Board of Minnesota at a largely increased salary, resigned his position as chief of the Meat Inspection Division. Dr. Ward's departure was a distinct loss to the branch, as his knowledge and ability had proved of great value in the organization of the Meat Inspection Service in its initial stages. Under the circumstances, however, it would have been unreasonable to expect him to remain. He was succeeded, as Chief of the Meat Inspection Division, by Dr. Robert Barnes, formerly travelling inspector, Dr. E. A. Bruce being promoted to the place thus left vacant.

The following veterinary inspectors were added to the Meat Inspection staff during the year:

Dr. M. Barker,  
Dr. D. R. Bone,  
Dr. G. S. Brownridge,  
Dr. A. E. Cameron,  
Dr. L. J. Demers,  
Dr. A. R. Douglas,  
Dr. J. R. English,  
Dr. E. R. Farewell,

Dr. A. J. G. Hood,  
Dr. J. C. Jones,  
Dr. William Lawson, (Transferred from  
Field Division.)  
Dr. C. McConachie,  
Dr. R. D. Orr,  
Dr. A. C. Ramsay,  
Dr. J. H. Shonyo.



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Several additions were made to the clerical staff, while a number of lay inspectors were also appointed.

In the Live Stock Branch Mr. G. W. Clemons and Mr. T. H. Mason were added to the staff of inspectors engaged in conducting the work of the Canadian Record of Performance.

My own time has, as usual, been very fully occupied.

Early in May, acting under your instructions, I proceeded to Rome as Delegate for Canada to the Permanent Committee of the International Institute of Agriculture. A full report of this, as well as of the second visit paid to Rome in November, is published herewith.

While in Europe I visited the French National Veterinary School at Alfort near Paris where I was very kindly received by the Director in control, Professor G. Barrier. I discussed with him the question of veterinary education in Quebec with a view to promoting, if possible, the introduction of the modern French veterinary teaching to the whole profession in Canada through the medium of the Laval School, which is admirably adapted for the task.

In England I took up with the officers of the British Board of Agriculture several questions of mutual interest, and in this connection desire to place on record my grateful appreciation of the many courtesies extended to me by these gentlemen. I also visited the Royal and Highland Shows, the interval between these events being occupied in an earnest and searching inquiry into the conditions under which the marketing of Canadian cattle is carried on in Liverpool, London, Glasgow, and Manchester. In this work I was assisted by Mr. McHugh, who was temporarily employed by the Live Stock Branch to investigate fully all matters affecting the handling and transportation of Canadian export live stock. Mr. McHugh has furnished a special report, which is printed as an appendix hereto.

I returned to Ottawa early in August and after a busy fortnight in the office, I attended the Annual Meeting of the American Veterinary Medical Association, which was held in Philadelphia, September 8th to 11th, 1908. At this meeting I had the honour of being elected President for the year 1908-1909.

Having been appointed by you as an official delegate I attended the International Congress on Tuberculosis held at Washington, D.C., September 28th to October 5th, 1908. At this Congress it fell to my lot to read a paper in which the difficulties to be encountered in dealing with the disease were fully set forth. This paper has, I may say, been extensively republished and reviewed, not only in America, but in other parts of the world, and its conclusions have been endorsed by most of those who have studied the subject from a practical point of view.

On October 26th I again left for Rome in my capacity as Canadian delegate to the International Institute of Agriculture.

On my return journey while in London, I had the privilege of being present at an interview between yourself and the Right Hon. John Burns, President of the Local Government Board, at which the regulations affecting the admission to the United Kingdom of Canadian meats and meat products were discussed. Later I had several interviews on the same subject with the permanent officials entrusted with the promulgation and enforcement of the regulations in question.

Reaching Ottawa again on December 27 I found the situation with regard to the protection of the Canadian frontier against the introduction of Foot and Mouth Disease still very acute, and it was therefore necessary for me to remain almost constantly on duty at headquarters.

I, however, attended as Live Stock Commissioner, a number of the annual meetings of the various Breed Associations, among others that of the French Canadian Stock Breeders of the Province of Quebec.



ANTHRAX.

The following outbreaks were reported and dealt with during the year:—

Province.	Outbreaks.	Animals died.
Quebec.. . . . .	2	7
Ontario.. . . . .	7	12

In Quebec, the two outbreaks were in the Three Rivers and Richmond district, respectively.

In Ontario six outbreaks were in Durham county and one in Dundas.

Four hundred and sixty-four doses of anthrax vaccine were supplied from the Biological Laboratory.

BLACK QUARTER.

Eight thousand and sixty-four doses of Blackleg vaccine were shipped from Ottawa, in addition to that sold by druggists throughout the Dominion.

RABIES.

One hundred and sixty-three premises were quarantined on account of the prevalence of rabies in the adjacent districts, distributed as follows:—

Ontario—

District.	Premises Quarantined.
Haldimand.. . . . .	8
Brant.. . . . .	3
Norfolk.. . . . .	39
North Oxford.. . . . .	3
Centre York.. . . . .	2
Welland.. . . . .	1
South Waterloo.. . . . .	1
Wentworth.. . . . .	6
South Oxford.. . . . .	1

Saskatchewan—

Qu'Appelle.. . . . .	94
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Alberta—

Red Deer.. . . . .	5
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SHEEP SCAB.

In Ontario 226 animals on 15 premises were found to be affected with sheep scab, involving the quarantine of 749 sheep on 30 premises, distributed as follows:—

County—

	Affected.	Quarantined.
Ontario.. . . . .	57	278
Simcoe.. . . . .	140	314
Lambton.. . . . .	27	133
Middlesex.. . . . .	2	24
	226	749

In British Columbia 1,187 sheep on three premises are in quarantine on suspicion of the existence of sheep scab.



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MALADIE DU COIT.

Twenty-eight animals valued at \$3,760 were slaughtered as being affected with this disease, at a cost of \$2,506.54, distributed as follows:—

Saskatchewan—

District.	Suspected and Quarantined.	Slaughtered.
Maple Creek... ..	44	5
Value, \$600.		
Compensation, \$400.		

Alberta—

District	Suspected and Quarantined.	Slaughtered
Mayton... ..	119	1
Medicine Hat... ..	58	11
Pincher... ..	..	4
Lethbridge... ..	59	11
Calgary... ..	1	1
	<u>237</u>	<u>28</u>

Value, \$3,160.

Compensation, \$2,106.64.

HORSE MANGE.

Province.	Outbreaks.	Animals affected.	Animals quarantined.
New Brunswick... ..	1	3	3
Quebec... ..	59	80	113
Ontario... ..	3	7	12
Manitoba... ..	12	41	65
Saskatchewan... ..	33	110	185
Alberta... ..	44	256	2,827
Total... ..	152	497	3,205

1,256 horses were inspected on being presented for shipment from the quarantined area in Alberta and Saskatchewan.

CATTLE MANGE.

In Ontario two outbreaks of Cattle Mange were detected, one at Walkerville and the other by our boundary officer at Bridgeburg. In the latter case the animals were sent to an abattoir in Toronto for slaughter.

In Saskatchewan twenty-five bands of cattle were quarantined, involving the control of 6,280 cattle. Only 145 of these, however, were found to be affected.

In Alberta 620 bands of cattle were quarantined, involving the control of 181,971 cattle. Only 15,143 of these, however, were found to be affected.

Five thousand three hundred and ninety-six cattle were inspected on being presented for shipment from the quarantined area in Alberta and Saskatchewan.

One hundred and sixty-five thousand three hundred and sixty cattle were inspected in Winnipeg on arrival from points west thereof, all suspected animals (69) being forbidden export east.



TUBERCULOSIS.

Four hundred and thirty-eight cattle were tested for export, 27 of which reacted and 411 successfully withstood the test.

Two hundred and seventy-two cattle were tested on being imported into Canada, 9 of which reacted, 4 were classed as suspicious and 259 proved healthy.

Three thousand four hundred and forty-seven cattle were tested by private practitioners with tuberculin supplied by this department, 451 of which reacted, 47 were classed as suspicious and 2,949 proved to be healthy.

With regard to this general testing, it must be borne in mind that in many cases the existence of tuberculosis is suspected in a herd before tuberculin is applied for and the proportion of reactors cannot be cited as that obtained from indiscriminate testing.

All reactors were permanently earmarked by a veterinary inspector in cases where the owner did not voluntarily destroy them.

HOG CHOLERA.

ONTARIO.

Twenty-three outbreaks of Hog Cholera occurred in Ontario in which 1,500 hogs, valued at \$11,891.25, were destroyed in the undermentioned counties, at a cost of \$7,927.45.

Two hogs valued at \$15.00 were also destroyed for purposes of examination at a cost of \$9.99 but no evidence of Hog Cholera was found.

	No. of Outbreaks.	Hogs Destroyed.
County of Essex—		
South Sandwich Township.. . . . .	2	105
East Sandwich Township.. . . . .	1	29
County of Brant—		
Brantford Township.. . . . .	1	40
County of Oxford—		
Oxford Township.. . . . .	1	134
County of York—		
York Township.. . . . .	4	797
Scarboro Township.. . . . .	1	23
County of Nipissing—		
Waters Township.. . . . .	5	17
McKim Township.. . . . .	7	353
County of Simcoe—		
Nottawasaga Township.. . . . .	1	2
	23	1,500

BRITISH COLUMBIA.

Nineteen outbreaks of Hog Cholera occurred in British Columbia in which 381 hogs, valued at \$2,978.20 were slaughtered in the following districts at a cost of \$1,985.40.

	No. of Outbreaks.	Hogs Destroyed.
New Westminster District.. . . . .	15	279
Vancouver District.. . . . .	1	1
Kootenay District.. . . . .	1	72
Victoria District.. . . . .	2	29
	19	381



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In Quebec 2 hogs valued at \$40.00 were killed for diagnostic purposes at a cost of \$26.66. No evidence of Hog Cholera was found.

The total number of hogs slaughtered throughout the Dominion as being affected with Hog Cholera, therefore, was 1,881, the value of which was \$14,869.45 and the compensation paid \$9,912.85.

## GLANDERS.

## DOMINION.

981	{ 39 killed on inspection			} Valued at \$110,081.50; At a cost of \$73,386.88.
	820	"	1st test	
	113	"	2nd "	
	8	"	3rd "	
	1	"	4th "	

Three hundred and eighty-one showed clinical symptoms.

Twenty thousand four hundred and one horses were tested with mallein, of which 942 reacted and were destroyed. Of the 942 reactors 342 showed clinical symptoms of Glanders at or during the test.

Four hundred and forty-two horses are under control for retest.

Of the above 981 horses slaughtered, 82 were killed without compensation as being diseased when imported into Canada.

## PRINCE EDWARD ISLAND.

One horse was tested and found to be healthy.

## NOVA SCOTIA.

Twenty-three horses were tested and found to be healthy.

## NEW BRUNSWICK.

Ninety-two horses were tested and found to be healthy.

## QUEBEC.

81	{ 10 killed on inspection			} Valued at \$10,610, at a cost of \$7,073.28.
	9	"	1st test	
	2	"	2nd "	

Forty-five showed clinical symptoms.

Four hundred and ninety-one horses were tested with mallein of which 71 reacted and were destroyed.

Of the 71 reactors 35 showed clinical symptoms of glanders at or during the test.

Five horses are under control for retest.



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Of the 81 horses slaughtered in Quebec

81	{	2	were in the district of	Richelieu,
		6	"	Quebec,
		2	"	Drummond,
		4	"	Terrebonne,
		1	"	Montreal,
		40	"	Labelle,
		1	"	St. Johns and Iberville,
		2	"	Wright,
		1	"	Joliette,
		3	"	Montcalm,
		1	"	Jacques Cartier,
		1	"	Lotbiniere,
		1	"	Bellechasse,
		3	"	Yamaska,
		1	"	Beauce,
		7	"	Berthier,
		3	"	Maskinonge,
		1	"	Charlevoix,
		1	"	Dorchester.

#### ONTARIO.

71	{	11	killed on inspection	}	Valued at \$8,785; at a cost of \$5,856.62.
		57	" 1st test.		
		3	" 2nd "		

Forty showed clinical symptoms.

Six hundred and eighty-one horses were tested with mallein, of which 60 reacted and were destroyed. Of the 60 reactors 29 showed clinical symptoms of glanders at or during the test.

Two horses are under control for retest.

Of the 71 horses slaughtered in Ontario—

71	{	47	were in the district of	Thunder Bay and Rainy River.
		2	"	Grenville.
		1	"	York, North.
		6	"	Halton.
		7	"	Hastings, West.
		5	"	Peterborough, East.
		1	"	Middlesex, North.
		1	"	Russell.
		1	"	Peterborough, West.

#### MANITOBA.

124	{	4	were killed on inspection	}	Valued at \$13,957.50; at a cost of \$9,304.91.
		100	" 1st test		
		17	" 2nd "		
		2	" 3rd "		
		1	" 4th "		

Fifty-one showed clinical symptoms.

Four thousand eight hundred and fifty-nine horses tested with mallein, of which 120 reacted and were destroyed.

Of the 120 reactors 47 showed clinical symptoms of glanders at or during the test.



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Sixty-seven horses are under control for retest.

Of the 124 horses slaughtered—

124	{ 5 were in the electoral district of Winnipeg.			
	12	"	"	Macdonald.
	15	"	"	Provencher.
	20	"	"	Dauphin.
	24	"	"	Souris.
	26	"	"	Marquette.
	9	"	"	Lisgar.
	7	"	"	Selkirk.
	6	"	"	Portage la Prairie.

## SASKATCHEWAN.

463	{ 12 killed on inspection }			Valued at \$54,501; at a cost of \$36,333.60.
	401	"	1st test	
	48	"	2nd "	
	2	"	3rd "	

One hundred and fifty-five showed clinical symptoms.

Seven thousand eight hundred and ninety-eight horses were tested with mallein, of which 451 reacted and were destroyed.

Of the 451 reactors 143 showed clinical symptoms of glanders at or during the test.

One hundred and seventeen horses are under control for retest.

Of the 463 horses slaughtered—

463	{ 115 were in the district of Assiniboia.			
	14	"	"	Battleford.
	16	"	"	Humboldt.
	39	"	"	Mackenzie.
	135	"	"	Moosejaw.
	39	"	"	Prince Albert.
	44	"	"	Qu'Appelle.
	38	"	"	Regina.
	5	"	"	Saltcoats.
	18	"	"	Saskatoon.

## ALBERTA.

223	{ 2 killed on inspection }			valued at \$19,993.00 at a cost of \$13,288.52
	179	"	1st test	
	40	"	2nd "	
	2	"	3rd "	

Eighty-five showed clinical symptoms.

Three thousand six hundred and seventy-three horses were tested with mallein of which 221 reacted and were destroyed.

Of the 221 reactors 83 showed clinical symptoms of glanders at or during the test.

Two hundred and fifty-one are under control for retest.

Of the 223 horses slaughtered:

223	{ 7 were in the district of Strathcona,			
	58	"	"	Red Deer,
	10	"	"	Calgary,
	40	"	"	Medicine Hat,
	53	"	"	Macleod,
	5	"	"	Victoria,
	10	"	"	Edmonton,



BRITISH COLUMBIA.

19 { 14 killed at 1st test  
3 " " 2nd "  
2 " " 3rd " } valued at \$2,295.00.  
at a cost of \$1,529.95.

Five showed clinical symptoms.

One thousand two hundred and seventy-three horses were tested with mallein of which 19 reacted and were destroyed.

Of the 19 reactors 5 showed clinical symptoms of glanders at or during the test.

No horses are under control for retest.

Of the 19 horses slaughtered:

19 { 14 were in the district of Yale-Cariboo,  
4 " " " Kootenay,  
1 " " " Vanvouver.

YUKON.

Twenty-six horses were tested with mallein and found healthy.

COMPARATIVE STATEMENT OF GLANDERS STATISTICS.

	1904-05.	1905-06. (5 mos.)	1906-07.	1907-08.	1908-09.
Horses tested . . . . .	4,899	3,957	8,687	11,428	20,401
Horses reacted . . . . .	1,854	1,285	1,704	1,240	942
Horses killed . . . . .	2 113	1,387	1,881	1,324	981
Clinical cases . . . . .	932	561	954	635	381
Compensation paid . . . . .	\$147,851 43	\$108,045 76	\$142,057 07	\$102,868 65	\$73,386 88

DISEASED IMPORTS, 1908-09.

Port.	No. of Horses in infected Shipments.	No. of Shipments.	No. of Horses Diseased.	Country of Origin.	Action.
St. Johns, Que. . . . .	1	1	1	U.S. . . . .	Returned.
Bridgeburg, Ont . . . . .	1	1	1	" . . . . .	"
Emerson, Man. . . . .	150	27	42	" . . . . .	28 returned 14 destroyed.
Gretna, Man . . . . .	39	7	16	" . . . . .	12 returned 4 destroyed.
Bannerman, Man. . . . .	29	7	11	" . . . . .	10 returned 1 destroyed.
Manitoba, general . . . . .	24	6	7	" . . . . .	5 returned 2 destroyed.
North Portal, Sask. . . . .	339	53	81	" . . . . .	21 returned 60 destroyed.
Wood Mountain, Sask. . . . .	18	6	8	" . . . . .	6 returned 2 destroyed
Willow Creek, Sask. . . . .	8	2	2	" . . . . .	Returned.
Big Muddy, Sask. . . . .	8	4	4	" . . . . .	"
Pendant d'Oreille, Alta. . . . .	15	2	3	" . . . . .	"
Coutts, Alta. . . . .	54	12	22	" . . . . .	"
Twin Lakes, Alta. . . . .	24	6	9	" . . . . .	8 returned 1 destroyed.
Rossland, B.C. . . . .	11	1	4	" . . . . .	Returned.
Grand Forks, B.C. . . . .	28	3	7	" . . . . .	"
Midway, B.C. . . . .	11	4	9	" . . . . .	"
Myncaster, B.C. . . . .	9	5	8	" . . . . .	"
Bridesville, B.C. . . . .	5	2	3	" . . . . .	"
Osooyos, B.C. . . . .	21	1	2	" . . . . .	"
Victoria, B.C. . . . .	1	1	1	" . . . . .	"
Chopaka, B.C. . . . .	2	1	1	" . . . . .	"
Total. . . . .	798	152	242		

Two cattle were refused admission from the United States at Nelson, B.C., being affected with tuberculosis.



## SESSIONAL PAPER No. 15b

## IMPORT TESTING.

Twelve thousand one hundred and seventy five horses were tested on arrival from the United States, distributed as follows:—

Entered at.	Number.	Entered at.	Number.
Charlottetown, P.E.I.. . . . .	1	Bannerman.. . . .	173
Halifax, N.S.. . . . .	12	Man. General.. . . .	54
Yarmouth.. . . .	9	North Portal, Sask.. . . .	4881
Woodstock, N.B.. . . .	22	Wood Mountain.. . . .	217
Aroostock Jct.. . . .	27	Big Muddy.. . . .	72
McAdam Jct.. . . .	8	Willow Creek.. . . .	180
Edmundston.. . . .	10	Sask. General.. . . .	2
Debec Jct.. . . .	1	Coutts, Alta.. . . .	329
St. Leonards.. . . .	5	Pendant d'Oreille.. . . .	81
St. John.. . . .	8	Twin Lakes.. . . .	114
N.B. General.. . . .	9	Alta. General.. . . .	1
Sherbrooke, Que.. . . .	149	Gateway, B.C.. . . .	51
St. Johns.. . . .	61	Kingsgate.. . . .	583
Athelstan and Dundee.. . . .	87	Rossland.. . . .	42
Cornwall, Ont.. . . .	5	Nelson.. . . .	10
Prescott.. . . .	28	Grand Forks.. . . .	39
Morrisburg.. . . .	4	Midway.. . . .	32
Kingston.. . . .	9	Myncaster.. . . .	19
Toronto.. . . .	9	Chopaka.. . . .	36
Niagara Falls.. . . .	42	Bridesville.. . . .	38
Bridgeburg.. . . .	115	Osoyoos.. . . .	107
Windsor.. . . .	101	New Westminster.. . . .	177
Sarnia.. . . .	73	Vancouver.. . . .	71
Sault Ste. Marie.. . . .	22	Victoria.. . . .	66
Fort Frances.. . . .	24	B.C. General.. . . .	2
Rainy River.. . . .	23	White Horse, Y.T.. . . .	25
Emerson, Man.. . . .	3062		
Gretna.. . . .	847		12,175

## IMPORT INSPECTIONS FROM EUROPE FROM APRIL 1st, 1908 to MARCH 31st, 1909.

	Horses.	Cattle.	Sheep.	Swine.	Goats.
Halifax, N.S. ....	7	..	3	..	..
St. John, N.B. ....	242	8	110	..	5
Quebec, Que. ....	29	155	1,735	8	..
Sherbrooke .....	30	..	..	..	..
Montreal .....	544	..	..	..	..
Niagara Falls, Ont .....	1	..	..	..	..
Total .....	853	163	1,848	8	5

One horse, 2 goats and 5 asses were also imported from the West Indies.



1 GEORGE V., A. 1911

PURE BRED IMPORTS FOR THE YEAR ENDING MARCH 31st, 1909.

HORSES AND ASSES.

Breed.	Great Britain.	United States.	Elsewhere.	Total.
Clydesdale	559	20	..	579
Percheron	10	139	46	195
Shetland	91	8	..	99
Thoroughbred	7	71	1	79
Standard Bred	..	72	..	72
Belgian	40	13	11	64
Hackney	38	3	..	41
Shire	33	3	..	36
Welsh Pony	28	..	..	28
Suffolk	13	..	..	13
French Coach	..	7	..	7
German Coach	..	4	..	4
Ponies	4	..	..	4
Mountain Pony	2	..	..	2
Polo Pony	2	..	..	2
American Coach	..	1	..	1
Saddle	..	1	..	1
Coach	1	..	..	1
Morgan	..	1	..	1
Hackney	1	..	..	1
York Pony	1	..	..	1
Donkey	1	..	..	1
Ass	1	..	..	1
Total	832	343	58	1,233

CATTLE.

Breed.	Great Britain.	United States.	Total.
Holstein	..	93	93
Ayshire	59	3	62
Shorthorn	37	12	49
Jersey	27	16	43
Dexter Kerry	28	..	28
Hereford	..	27	27
Red Polled	..	21	21
Polled Angus	12	6	18
Galloway	..	4	4
Swiss	..	2	2
Durham	..	2	2
Aberdeen Angus	..	1	1
Angus	..	1	1
Guernsey	..	1	1
Total	163	189	352



## SESSIONAL PAPER No. 15b

PURE BRED IMPORTS FOR THE YEAR ENDING MARCH 31st, 1909—*Continued.*

## SHEEP.

Breed.	Great Britain.	United States.	Total.
Shropshire .....	1,304	14	1,318
Hampshire .....	185	1	186
Suffolk .....	45	54	99
Oxford .....	89	1	90
Cotswold .....	56	..	56
Lonk .....	55	..	55
Dorset .....	46	..	46
South Down .....	31	..	31
Leicester .....	8	..	8
Lincoln .....	8	..	8
Kerry Hills .....	7	..	7
Cheviot .....	5	..	5
St. Kilda .....	4	..	4
Shetland .....	2	..	2
Total .....	1,845	70	1,915

## SWINE.

Breed.	Great Britain.	United States.	Total.
Hampshire .....	..	7	7
Berkshire .....	5	..	5
Duroc Jersey .....	..	4	4
Yorkshire .....	3	..	3
Poland China .....	..	3	3
Total .....	8	14	22

## GOATS.

Breed.	Great Britain.	United States.	Total.
Nubian .....	5	..	5
Angora .....	..	9	9
Total .....	5	9	14

## BUFFALOES.

Breed.	Great Britain.	United States.	Total.
Buffaloes .....	..	3	3



1 GEORGE V., A. 1911

IMPORT INSPECTIONS FROM UNITED STATES AND NEWFOUNDLAND FROM  
APRIL 1st, 1908, MARCH 31st, 1909.

	Horses.	Mules.	Cattle.	Sheep.	Swine.	Goats.	Buffalo.
Charlottetown, P.E.I.	1						
Halifax, N.S.	5						1 ass.
Yarmouth	14		10				
Sydney	101						6 caribou.
St. John, N.B.	45		2	1			
Debec Jet.	1						
Edmunston	10						
Woodstock	28						
St. Leonards	5						
McAdam Jet	32		1				
Arcoostook Jet.	51		1				
St. Stephen	1						
Montreal, P.Q.	3						
St. John's	371	5	6	14		5	3 buffalo.
Sherbrooke	276	5	56	38			
Athelstan and Dundee	91		206			1	
Cornwall, Ont.	10						
Prescott	151		3				
Cobourg	1						
Morrisburg	7		3				
Brockville			13				
Kingston	9		4				
Niagara Falls	441	7	6	28		8	
Bridgeburg	838	3	22	405			
Toronto	10						
Windsor	499	1	72	71	2		
Sarnia	198	11	11	221	7	5	4 camels.
Sault Ste Marie	22		9				
Fort Frances	34		6				
Rainy River	26		10				
Emerson, Man.	4,289	663	1,343	129	10	5	
Gretna, Man.	1,047	172	483	115		2	
Bannerman	345	2	136				
Manitoba General	50		35	32			
North Portal, Sask.	8,247	446	4,778	27	17		
Big Muddy	228	3	10				
Wood Mountain	539	1	35		1		
Willow Creek	243						
Sask. General	5						
Pendant d'Oreille, Alta.	66		7				
Combs	865	103	48	200		3	
Twin Lakes	520	7	11				
Alta. General	1						
Gateway, B.C.	200	2	2				
Kingsgate	735	20	109	505			
Nelson	11		176	785			
Rossland	45		181	285			
Grand Forks	49	2	80				
Midway	37		51				
Myncester	26		19	35	25		
Bridesville	43		178	2,407			
Chopaka	46		9				
Osoyoos	262	1	17	200			
New Westminster and District	674	12	143	7,246	5	18	1 camel. 2 burros.
Vancouver	234	4	2	16,586			
Victoria	196	76	6	14,422	2		6 deer.
B. C. General	2						
Whitehorse, Y.T.	65		437	65			
Total	22,351	1,546	8,737	43,817	69	47	5 camels. 3 buffalo. 6 caribou. 6 deer. 2 burros. 1 ass.



## SESSIONAL PAPER No. 15b

## ANIMALS INSPECTED FOR EXPORT FROM APRIL 1st, 1908—MARCH 31st, 1909.

	Horses.	Cattle.	Sheep.	Swine.
Montreal to Great Britain .....	116	99,474	9,674	.....
Inspected at Montreal for shipment to Great Britain via Boston and Portland .....	...	21,342	13,230	.....
Montreal to South Africa .....	...	65	68	.....
Montreal to Newfoundland .....	...	85	85	.....
Halifax to Great Britain .....	...	2,982	.....	.....
" St. Vincent .....	...	3	8	.....
" Jamaica .....	2	6	363	.....
" Bermuda .....	15	74	95	1
" Barbadoes .....	24	...	...	...
" St. Pierre and Miquelon .....	...	14	4	19
" Newfoundland .....	1	46	...	...
" Trinidad .....	...	...	82	...
" St. Kitts and St. Lucia .....	1	3	...	6
St. John, N. B. to Great Britain .....	65	22,192	149	...
Sydney to Newfoundland .....	314	685	8	4
Sydney to St. Pierre and Miquelon .....	2	129	377	15
Charlottetown, P.E.I. to Newfoundland .....	77	1,238	2,032	83
Bridgeburg to United States .....	...	...	32,276	...
Bridgeburg to Great Britain via U.S. .....	...	7,289	...	...
Toronto to Great Britain .....	...	5,689	300	...
" United States .....	...	...	2,846	...
" West Indies .....	...	18	70	...
Bayfield and Mulgrave to Newfoundland .....	53	754	480	...
Total .....	670	162,003	62,147	128

Export Animals rejected at following ports from April 1, 1908, to March 31, 1909.

Port.	Cattle.	Sheep.
Halifax, N.S. ....	1	...
Sydney, N.S. ....	2	...
St. John, N.B. ....	12	...
Montreal, Que. ....	424	48
Total .....	439	48

Of the above 105 cattle at Montreal were rejected for actinomycosis and 2 cattle for mange. The rest of the animals were suffering from lameness, or injuries received during transportation, and showed no indication of contagious or infectious disease.

## MEAT INSPECTION.

Very satisfactory progress has been made in the development and further organization of the Meat Inspection service inaugurated in September, 1907, under the authority of The Meat and Canned Foods Act.

The operations of this Division, although of course confined to establishments engaged in export or interprovincial trade, are attracting much favourable comment, as a result of which there is every reason to believe that like methods of inspection will shortly be adopted by municipal authorities in many communities throughout the country.

A very great deal of good has also been effected by the application of the provisions of the Act to establishments engaged in the preservation of fruits and vegetables, and in the preparation of condensed milk.



1 GEORGE V., A. 1911

Although in some cases the conditions, sanitary and otherwise, in these establishments were found to be satisfactory, in others they were quite the reverse. But little difficulty, however, has been experienced by the inspectors in convincing owners and managers that a ready compliance with the requirements of the Department would be to their advantage. A marked improvement in sanitary conditions as well as in methods of operation and in quality of materials used has resulted from the inauguration of this new service.

A full report of the work done in the Meat Inspection Division will be found elsewhere.

## ESTABLISHMENTS UNDER INSPECTION, MARCH 31st, 1909.

No.	Name.	Place.	Inspectors in Charge.
1	Fowler's Canadian Co. ....	Hamilton .....	H. H. Ross, V.S. A. C. Ramsay, V.S. J. Edgecombe.
2A	Geo. Matthews Co., Ltd. ....	Hull, P.Q. ....	T. H. Richards, V.S. J. Terrance.
2B	" .....	Brantford .....	F. A. Walsh, V.S.
2C	" .....	Peterborough. ....	W. A. Henderson, V.S. D. R. Bone, V.S.
25	Montreal Abattoir Co. ....	Montreal .....	M. J. Kellam, V.S. C. E. Derome, M.V. W. H. James, V.S. K. R. Foster, V.S. R. D. Orr, V.S.
4B	Davies Limited .....	" .....	A. R. Torrie, V.S. A. R. Crooks, V.S. J. Briere.
5	Laing Packing and Provision Co. ....	" .....	J. W. Symes, D.V.S. E. G. Lemieux, M.V. A. J. G. Hood, M.V. H. Macey.
22	Montreal Union Abattoir Co. ....	" .....	W. Kime, V.S. W. J. Morgan, V.S. J. W. Purdy, V.S. A. R. Douglas, D.V.S. J. R. Young. Geo. Brown.
24	Wm. Clark .....	" .....	C. D. Bancroft, D.V.S.
29	N. K. Fairbanks Co. ....	" .....	A. W. Beach, V.S.
4A	Wm. Davies Co., Ltd. ....	Toronto. ....	L. A. Willson, V.S. J. E. Morse, V.S. G. C. Brownridge, V.S. M. W. Everett. Denis Brown.
6	Park Blackwell Co. ....	" .....	T. M. Pine, V.S. J. B. White, V.S. J. D. Irvine, V.S.
7	Harris Abattoir Co. ....	" .....	R. E. Murray, V.S. A. C. Walker, V.S. J. H. George, V.S. F. C. Jones, V.S.
8	D. B. Martin Co. ....	West Toronto. ....	F. Fisher, V.S. J. A. Hodgins.
9	Gunns Limited .....	" .....	J. A. McLeish, V.S. S. S. Dickinson, V.S.
4C	Davies Packing Co. ....	Harriston. ....	C. J. Johannes, V.S.
10	F. W. Fearnan Co., Ltd. ....	Hamilton. ....	J. W. Porter, V.S. W. A. Morrin, D.V.S.
11	Ingersoll Packing Co. ....	Ingersoll. ....	F. H. S. Lowrey, V.S. E. R. Farewell, V.S.
13	Whyte Packing Co. ....	Stratford. ....	C. E. Edgett, V.S.
14	Collingwood Packing Co. ....	Collingwood. ....	J. R. Thompson, V.S.
15	Jos. O'Mara .....	Palmerston. ....	S. Ransom, V.S.
16	Wm. Ryan Co. ....	Fergus. ....	H. E. Marshall, V.S.
17	H. Coleman. ....	Kincardine. ....	Wm. Lawson, V.S.



## SESSIONAL PAPER No. 15b

ESTABLISHMENTS UNDER INSPECTION, MARCH 31st, 1909—*Continued.*

No.	Name.	Place.	Inspectors in Charge.
27	Tillsonburg Packing Co. . . . .	Tillsonburg . . . . .	D. A. Irvine, V.S.
18	J. Y. Griffin Co. . . . .	Winnipeg . . . . .	A. R. Walsh, V.S. J. H. Shonyo, V.S. J. R. English, V.S.
19	Gordon, Ironside & Fares. . . . .	" . . . . .	W. R. Bell, V.S. B. A. Bescoby, V.S. C. Maconachie, V.S.
20	Gallagher, Holman & Lafrance. . . . .	" . . . . .	J. D. Ross, V.S. A. E. Cameron, V.S. A. Hobbs, V.S.
21	Western Packing Co. . . . .	" . . . . .	J. H. Snider, V.S.
23	P. Burns Co. . . . .	Calgary . . . . .	W. A. McGill, V.S. C. W. J. Haworth, V.S. T. G. McClelland.
18B	J. Y. Griffin Co. . . . .	Edmonton . . . . .	C. C. Evely, V.S. M. Barker, V.S.
30	Vogel Meat Co. . . . .	Strathcona . . . . .	I. Christian, V.S.
33	Dominion Meat Co. . . . .	Calgary . . . . .	W. A. McGill, V.S.
40	Aylmer Canning Co. . . . .	Aylmer, Ont. . . . .	D. C. Tennent, V.S.

Chief, Meat Inspection Division. . . . . R. Barnes, V.S.  
 Travelling Inspector. . . . . E. A. Bruce, V.S.  
 In charge of Montreal. . . . . M. J. Kellam, V.S.  
 In charge of Toronto. . . . . L. A. Willson, V.S.  
 In charge of Winnipeg. . . . . C. D. McGilvray, M.D.V.  
 Inspectors of Canning Factories. . . . . R. Bowlby,  
 . . . . . F. E. N. Boulter.

DISEASES FOUND ON POST-MORTEM INSPECTION, AND NUMBER OF CARCASSES  
AND PORTIONS CONDEMNED FROM APRIL 1st, 1908, TO MARCH 31st, 1909.

Disease.	Cattle.			Swine.			Sheep.		
	Car.	Por.	Lbs.	Car.	Por.	Lbs.	Car.	Por.	Lbs.
Abscess. . . . .	29	14,617	48	41	2,239	133	2	92	
Actinomycosis. . . . .	7	2,905		4	214	10			
Adenoma . . . . .	1								
Angeoma. . . . .		2							
Ankylosis . . . . .		1							
Arthritis. . . . .					2				
Atrophy. . . . .		80			1				
Bronchitis. . . . .		2							
Bruises. . . . .	185	5,420	1,696	25	1,645	11,247	40	187	246½
Calcification. . . . .		7	12						
Caries. . . . .		1							
Cirrhosis. . . . .		11			15			1	
Congestion. . . . .		9			9			11	
Cripples. . . . .	10	126		24	3,041	1,853	1	17	
Cysts . . . . .	2	33		1	392				
Cysticercus Bovis. . . . .	66	24							
Cysticercus Cellulosae. . . . .				136	9				
Cysticercus Tenuicollis. . . . .							2	1	
Decomposition. . . . .				1	249				
Degeneration. . . . .	1	1			8				
Dirty. . . . .		30		1			1	16	
Downer. . . . .				6	4		1		
Dying Condition. . . . .	2			3			1		
Emaciation. . . . .	76			24	4		48		
Emphysema. . . . .		1			88				



DISEASES FOUND ON POST-MORTEM INSPECTION, &c.—Continued.

Disease.	Cattle.			Swine.			Sheep.		
	Car.	Por.	Lbs.	Car.	Por.	Lbs.	Car.	Por.	Lbs.
Enlarged Kidney ..					2				
Enteritis ..	7			21	1				
Erysipelas ..				1					
Exudation ..		3							
Frozen ..				3	11				
Gastritis ..		3		1					
Hemorrhage ..		1	528						
Heat Prostration..				3					
Hematodes ..	1								
Hepatitis ..		2			1				
Hernia ..		2		13	64				
Hog Cholera ..				2					
Hydremia Cachexia..	23			1	1		1		
Hydronephrosis..		5							
Hypertrophy..		2							
Immaturity..	2,570								
Imperfect Bleeding..	1			8	1				
Induration ..		1			133				
Inflammation..	4	4		38	21		2		
Jaundice ..	4			7	2		10		
Leukemia ..				2					
Lymphadenitis..	1						9	1,762	
Malformation ..					1				
Mammitis ..					19				
S. Mastitis ..			65						
Melanosis ..		2			1				
Metritis ..	7	2		7	1		3		
Necrosis ..		58		3	7,165			870	
Nephritis ..	2			4					
Nodules, Flukes, Para-									
sites ..	1	33,380	482	1	6,643	12	3	12,537	
Omphalo Phlebitis ..	7	606						30	
Oseophagostomum ..		1						96	
Osteomyelitis ..			75						
T. Pentastotumus..								1	
Pericarditis ..	16	79			9		1		
Peritonitis ..	8			34	36		2		
Pleuritis ..	13	516		81	948		6	63	
Pneumonia ..	43	2		185	33		33	5	
Pregnancy..	1			3					
Pyæmia ..	85	9		137	5		23		
Scalded ..				3	2				
Schirrous Cord..		1		2	1				
Scorched Burned..				5	12				
Sexual Smell.....				697	470	75			
Skin Disease ..				6	86				
Smothered ..				1					
Synovitis ..			15						
Tuberculosis ..	1,388	7,780	492	3,009	175,483	72			
Tumour..	2	23		3	39	290		1	
Uremia..	1			5	2				
Urticaria.....				1	29				
Vaginitis ..	1								
Wound..					7				
Total..	4,566	65,752	3,413	4,553	199,149	13,692	189	15,690	246½
Taken into Establish-									
ment contrary to Reg-									
ulations ..			345						
Found Dead ..	84			1,102			139		
	4,650	65,752	3,758	5,655	199,149	13,692	328	15,690	246½



## SESSIONAL PAPER No. 15b

## CONDEMNATION OF MEATS DURING THE COURSE OF REINSPECTION.

	Cattle.	Swine.	Sheep.	Poultry.
Decomposed . . . . .	448	586		
Sour . . . . .	87,453	227,703½	2,845	231½
Dirty . . . . .	6,665	9,461	699	
Total . . . . .	94,566	237,750½	3,544	231½

## SUMMARY—APRIL 1, 1908-9.

Total number of cattle slaughtered.. . . .	298,241
Carcases of cattle 'Condemned'.. . . .	4,566
Percentage of cattle 'Condemned'.. . . .	1.53
Portions of cattle 'Condemned'.. . . .	65,752
Total number of sheep slaughtered.. . . .	191,792
Carcases of sheep 'Condemned'.. . . .	189
Percentage of sheep 'Condemned'.. . . .	.098
Portions of sheep 'Condemned'.. . . .	15,690
Total number of swine slaughtered.. . . .	1,532,796
Carcases of swine 'Condemned'.. . . .	4,553
Percentage of swine 'Condemned'.. . . .	.297
Portions of swine 'Condemned'.. . . .	199,149
Total number of animals slaughtered.. . . .	2,022,829
Total number of carcases 'Condemned'.. . . .	9,288
Percentage of carcases 'Condemned'.. . . .	.459
Total number of portions 'Condemned'.. . . .	280,591
Total amount condemned on reinspection, 336,092 lbs.	

## LIVE STOCK BRANCH.

Although the work performed by this Branch during the year just past has been marked by no specially striking or unusual features, it has been generally effective, while considerable progress has been made in various directions.

## CANADIAN NATIONAL RECORDS.

The completion of the organization of the National Records, which during 1907 called for the expenditure of much time and labour, especially in the province of Quebec, has required considerable attention during the year just past.

Among the other matters of interest in this connection may be mentioned the continued work of the Commission entrusted with the task of inspecting French Canadian horses for registration in the new Stud Book. The members of the Commission were kept busy throughout the summer and fall, but, in spite of their best efforts, they found it impossible to finish their task at the time appointed for closing the Book, namely, December 31st, 1908. It was therefore necessary to postpone until the coming season the work of visiting the Counties of Gaspé and Bonaventure, as also Isle aux Coudres. As it is reported that there are a considerable number of typical French Canadian horses in these districts, it is hoped that many new registrations will be obtained.

There are also a few horses in Ontario, and some scattered throughout the North-west provinces, which will have to be inspected but there should be very few eligible horses left unregistered at the close of the coming season.



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The Exhibition held at St. John's, Quebec, in September last, afforded an excellent illustration of the value of the work undertaken by the Department in the direction of re-establishing the old French Canadian breed of horses on sound and legitimate lines. On this occasion no less than forty-six stallions and seventy-six mares, all registered in the new Record, were shown in competition for the special prizes offered by this Department acting in conjunction with the French Canadian Horse Breeders' Association. The quality of these animals was, in almost every case, very high and the exhibit created the most favourable impression on the many experienced horsemen from other provinces who were present.

It is, of course, somewhat doubtful as to whether it will be possible to re-establish the old breed in its entirety as the number of typical registered stallions available is very small in comparison with the number of mares scattered, as the latter are, over a wide territory. Many of those interested in the breed are in favour of permitting the registration for a limited time of selected stallions of other like breeds, and it is likely that this question will be carefully considered by the Association at its next meeting. So far, however, no animals have been registered other than those conforming closely to the established standard as regards size, type and breeding.

Since the date of my last report no additions have been made to the list of National Records, but it is expected that during the coming year a number of new Associations will be incorporated.

The movement for the establishment of these Records is largely due to the new Customs regulations, which, after being fully discussed by the members of the National Live Stock Association, at the meeting of that body held here in February, 1908, were later formulated by the National Records Board, and on your recommendation adopted by the Customs Department in June of last year. Under these regulations free entry to Canada can be granted to animals for the improvement of stock only upon the production by the importer of a certificate of registration in the Canadian National Records, or, in the case of Holstein-Friesian cattle, a similar certificate signed by the Secretary of the Holstein-Friesian Association of Canada. Animals for which no Record exists in Canada will be accorded free entry on the presentation of an import certificate issued by the Accountant of the Canadian National Records on the production to him by the importer of a certificate of registration in a recognized Record in the country of origin of the breed. It will be observed that under these regulations, animals coming from countries other than that in which the breed to which they belong originated, are debarred from free entry unless there is a Canadian Record in which they are eligible for entry. The effect of this limitation is to prohibit the free entry of a number of European breeds for which Records exist in the United States but not in Canada, and as the only way of overcoming this difficulty is through the formation of Canadian Records, action with this end in view is being taken by those interested.

The annual report of the Record Committee to the Record Board and The Record Associations is printed as an appendix hereto.

#### TRANSPORTATION OF PURE BRED STOCK.

New and much more favourable arrangements have been made with the railway companies for the transportation at reduced rates of pure bred stock when shipped for breeding purposes. This privilege is now granted to any shipper who can present a certificate of registration in the Canadian National Records, or, in the case of Holstein-Friesian cattle, a similar certificate of registration in the Holstein-Friesian Association of Canada. By this arrangement the interests of the shipper and the railway company are simplified and safe-guarded. The railway companies have further most generously granted a special concession to importers of pure bred stock,



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such animals being given the reduced rate from the port of entry to destination on the production by the owner, or person in charge, of a certificate signed by the Accountant of the Canadian National Records.

## COMMERCIAL LIVE STOCK TRANSPORTATION.

Realizing the importance of protecting the interests of the producer of commercial live stock, who is, as a rule, less able to guard his own interests than is the breeder of pure bred animals, I have for some time been devoting much attention to the question of transportation and marketing, with special reference to our export trade in ranch cattle. The methods of handling commercial live stock now in vogue in Canada are certainly capable of great improvement, and it is probable that after the subject has been fully investigated, it may be necessary to take action for the improvement of existing conditions by means of special legislation. A special report dealing with this subject is now in course of preparation and will shortly be published.

## RECORD OF PERFORMANCE.

This work, which has for its object the supervision and testing of pure bred dairy cows, is constantly increasing in popularity. In fact, the number of breeders of pure bred dairy stock desirous of availing themselves of its conditions has become so great that it has been necessary to add a third inspector for the Provinces of Ontario and Quebec, while in other parts of the Dominion the work is also growing.

Except in the provinces named, however, the work has not as yet grown to such an extent as to require that the men engaged should devote their whole time to it, although they are in all cases fully qualified for their duties. The demonstration of superior milking qualities in the various breeds and in different individuals of these breeds, has proved to be of great economic importance and the enthusiasm shown by owners is easily understood when it is realized that the prices, especially of young bulls of dairy strains, are largely controlled by the milk producing records of their progenitors. The work is also beneficial in many other ways as a desire to have each animal make the best possible showing leads to intelligent experimentation with different rations, as also to the cultivation of special care and kindness in the treatment of milking cows. These benefits are particularly well marked in the case of the young farmers and farmers' sons.

## SPEAKERS AND JUDGES.

Much has been done in the furnishing of speakers for institute meetings and instructors for live stock judging classes, as also judges for fairs in all the provinces except Ontario and Manitoba, in which work of this kind is taken care of by the provincial authorities. Needless to say, the Branch is always ready and willing to co-operate heartily with any of the provincial departments of agriculture.

## MARITIME WINTER FAIR.

Early in the year it was found necessary to make a new arrangement with the Maritime Stock Breeders' Association with regard to the management of the Winter Fair at Amherst. The usefulness of this institution, originally established under the auspices of this Branch in conjunction with the Departments of Agriculture of the three eastern provinces, has now been fully demonstrated. It is gratifying to be able to report that not only is public interest in the work increasing, but that tangible results are easily becoming more evident, and that there is a decided improvement in the quality of the stock presented for exhibit.



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## SHEEP INDUSTRY.

For a considerable time the business of sheep raising in Canada has failed to keep pace with other lines of agricultural industry. The number of sheep produced in the Dominion is unquestionably far below what it should be, especially in view of the enormous possibilities of the country as regards both grazing and winter feeding. I am strongly of opinion that no effort should be spared to remedy this regrettable state of affairs, although I am not at present prepared to define the exact lines which should be followed. A beginning was, however, made last year in Prince Edward Island and in some districts of Nova Scotia, which are particularly well adapted for sheep raising. One result of the experiments conducted by the Health of Animals Branch with the view of ascertaining the exact nature and cause of the malady, locally known as Pictou cattle disease, was the demonstration of the fact that sheep can be safely and profitably used in the eradication of ragwort, the weed to which the disease above mentioned is due. Although the experiments were concluded in the spring of 1908, the lease of the farm on which they were conducted did not expire until October. Advantage was taken of this fact to utilize these premises as a pasture for a number of pure bred rams which were purchased in Ontario, and after being grazed during the summer were sold in the fall at four different points in the weed infested area. The prices obtained were very encouraging, and I would urge that similar methods should be followed to stimulate the production of sheep not only in weed infested districts, as in this instance, but in all other localities where there is good reason to believe that the industry would be profitable.

## PUBLICATIONS.

Several publications on live stock subjects have been issued during the year, the most noteworthy of these being an exhaustive treatise on 'Sheep Husbandry in Canada.' The attractive form in which this bulletin, which contains much useful and practical information, was presented to the public is due to the interest shown in the work by Mr. J. B. Spencer, B.S.A., to whom its compilation was entrusted and who devoted much time and effort to the task.

Thanks are also due to Messrs. W. A. Hamilton, of Lethbridge, Alta.; J. A. McCaig, of Edmonton, Alta.; John McQueen, of Brandon, Man.; and A. W. Smith, of Maple Lodge, Ont., who contributed valuable articles, as did also several officers of the Department, including Dr. J. A. Couture, of Quebec, George H. Greig, of Winnipeg, and Dr. S. F. Tolmie, of Victoria.

Much valuable information was also received from the several provincial departments of agriculture; sheep buyers, wool dealers and woollen manufacturers, beside a large number of sheep raisers throughout the Dominion.

Thanks are also due to the *Farmers' Advocate*, the *Scottish Farmer*, and the *American Sheep Breeder*, for valuable photographs used in illustrating this work.

A bulletin somewhat similar in character, but dealing with the production of beef, is now in course of preparation and will be issued shortly.

In conclusion, I would say that the arrangement under which the Health of Animals and Live Stock Branches are operated under one head has, so far, been found very satisfactory, much effort and expense being saved in the performance of duties which formerly, to some extent, overlapped.

I have the honour to be,

Sir,

Your obedient servant,

J. G. RUTHERFORD,

*Veterinary Director General and  
Live Stock Commissioner.*

To the Honourable,

The Minister of Agriculture,

Ottawa, Ont.



SESSIONAL PAPER No. 15b

## APPENDIX No. 1.

G. HILTON, V.S., Chief Veterinary Inspector.

OTTAWA, March 31, 1909.

SIR,—

I have the honour to submit herewith my annual report for year ending March 31, 1909.

During the first five weeks of this period I was stationed at Regina completing the organization of the work of your Branch in the provinces of Saskatchewan and Alberta, which was taken over from the Commissioner of the Royal Northwest Mounted Police in July, 1907.

Dr. Hopkins, having been appointed to take charge of the work in Saskatchewan, arrived at Regina from Ottawa on April 20, and Dr. Hargrave, the officer chosen for Alberta, reported two days later. These officers were instructed in their duties as fully as possible, the details of the office and the administration of the work were carefully explained.

Mr. Spanner, who had been acting as clerk in the Regina office, returned for a temporary period to Medicine Hat with Dr. Hargrave for the purpose of opening the records in the new office at that point. With a staff consisting of Miss Crawford as stenographer, and Mr. Porter as clerk, Dr. Hargrave assumed charge of the work in Alberta on May 1 with headquarters at Medicine Hat.

The work in Saskatchewan was transferred on the same date to Dr. Hopkins, the Regina staff otherwise remaining unchanged.

Having completed the transfer of the work in these provinces, I immediately left Regina for Ottawa. Soon after my arrival you left for Rome as the official delegate for Canada to the International Institute of Agriculture, and I was placed in charge of the Health of Animals' Branch during your absence.

Upon your return on the 13th of August my duties were still confined to your office, and upon your leaving for Rome the second time on October 26, I again assumed charge.

On November 16, a cablegram was received from the British Board of Agriculture, advising this Department of the existence of Foot and Mouth disease near Danville in the State of Pennsylvania. The cable stated further that the affected cattle were reported to have been shipped from Toronto via Buffalo to Danville, and that some of the affected cattle were of Canadian origin.

The situation had a very serious aspect, especially so when it was found later that the affected animals had been shipped from Detroit through Canada to Buffalo.

Protective measures were immediately enforced, following those adopted by you during the outbreak of this disease in the New England States in 1902, and directly it was possible you were communicated with by cable and your instructions rigidly followed.

On November 16, a Ministerial Order was passed prohibiting the importation into Canada from the State of Pennsylvania of any cattle, sheep, swine, or goats, or of the flesh, hides, hoofs, horns, or other parts of same, for six months, as also any of the said species or products that had been within the said state within two months immediately preceding their offer for entry.

Two officers were promptly despatched to Toronto to obtain information relative to the origin of shipments which had passed through that point to Buffalo. Upon re-



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ceiving this information from the railway officials, they proceeded to the various farms from which these animals came, and made a careful inspection of all stock found on the premises. They were fortunately able to report the non-existence of any disease, and learned, while there, that these districts had been visited a few days previously by the United States Bureau officers, in an endeavour to trace the source of infection of the outbreak of Foot and Mouth Disease in that country. The fact that no restrictions were placed upon Canadian cattle by the American authorities confirmed the report of the inspectors of this Branch, and removed suspicion from this source.

Prompt measures were taken for the thorough disinfection under official supervision of all stock cars, and especially those of American origin. Special officers were placed at suitable points along the boundary to supervise this work. The stock yards at Toronto and Montreal were ordered to be disinfected, as also those on the railway lines running from Windsor to Niagara Falls and Bridgeburg. This work was performed under the supervision and to the satisfaction of the inspectors of this Branch.

In order to effectively enforce the restrictions the services of every available inspector were directed to this work, and numerous lay inspectors were appointed to assist them. Fortunately a water boundary separated the adjoining portions of the infected states, which made the carrying out of protective measures more practicable. A limited territory was given to each officer, for which he was responsible, and a systematic supervision of these men was maintained by a separate force of patrolling inspectors, who reported promptly existing conditions. In this connection I would say that without a single exception the Customs officers assisted the inspectors of this Branch very materially in their work.

In accordance with a cablegram received from you a large number of veterinarians were temporarily employed for the purpose of making a farm to farm inspection of all animals in the Niagara Peninsula, and also in the district around Toronto, for the purpose of satisfying the British authorities that this disease did not exist in that part of Canada.

Dr. Moore proceeded to Toronto, engaged the number of men required and organized the work there, while Dr. Stork performed similar duties at Windsor.

A great deal of trouble was experienced in disposing of hay and straw, which was used for packing of goods from the infected states, and which had been imported just previous to the enforcement of these restrictions. With the assistance of the Customs officers, however, this was eventually properly and safely disposed of.

Upon receiving further advice that the disease had been detected in the State of New York, the order already in force was rescinded on November 20th, and one substituted therefor, prohibiting the importation of all animals, or parts thereof, or hay, straw, fodder or manure from the States of Pennsylvania and New York. These restrictions were also placed upon similar importations from any state promptly upon receipt of information that infection existed therein, so that by the 28th of November importations were prohibited from the States of Pennsylvania, New York, New Jersey, Michigan, Maryland and Delaware.

In view of the fact that the United States regulations permitted the passage of live stock through the infected areas, it was deemed advisable, owing to the possibility of the introduction of this disease by indirect contact through wharfs and yards at Canadian ports, or the possibility of the development of the disease en route, to prohibit ships carrying live stock from American ports to touch any Canadian port. The shipment to Europe of Canadian animals through American ports, or the shipment of Canadian animals from Canadian ports in vessels carrying American live stock, or the shipment of Canadian live stock from Canada on a vessel which had touched at a port in any of the prohibited states within twenty-one days of the passing of the Order, was also prohibited.



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The exportation to Europe of Canadian live stock was further limited to the ports of St. John, N.B., and Halifax, N.S.

As no further outbreaks were reported in the United States, and it was apparent that the disease was under control, it was not necessary to enlarge on the restrictions already in force. In view, however, of the nature of the disease in question, every precaution was taken to see that the existing restrictions were effectively continued until your return in the latter part of December.

In conclusion I would say that the officers of this Branch fully realized the seriousness of the situation, which was evidenced by the zeal and despatch with which they performed their duties throughout the dangerous period.

I have the honour to be,

Sir,

Your obedient servant,

GEORGE HILTON,

*Chief Veterinary Inspector.*

The Veterinary Director General,  
Ottawa.



## APPENDIX No. 2.

R. BARNES, V.S., Chief, Meat Inspection Division.

OTTAWA, March 31, 1909.

SIR,—I have the honour to submit herewith my report of the work carried on under the Meat and Canned Foods Act for the year ending March 31, 1909.

During the first three months of the year, in my capacity as Travelling Inspector, I visited the various establishments coming under its operation in Ontario and Quebec, watching closely the carrying on of the work, and rendering such assistance as seemed to me to be necessary to promote uniformity and a systematic method of inspection.

Dr. S. H. Ward, who, since the inauguration of the work on September 3, 1907, had filled the position of Chief of the Meat Inspection Division, tendered his resignation, which was accepted to take effect on July 1, 1908, he having accepted a position as Secretary and Chief Executive Officer of the Live Stock Sanitary Board of the State of Minnesota. In consequence of this, changes in the personnel of your staff were made necessary.

Inspector E. A. Bruce, formerly in charge of the work of Inspection in one of the establishments, was delegated to take up my work as Travelling Inspector.

The progress made during the year has been very satisfactory when one considers the vast field of work covered by such a measure as The Meat and Canned Foods Act, and the limited number of qualified Inspectors available to carry out its provisions, who have been compelled to perform an arduous task, necessitating long hours of work which has been faithfully and willingly done.

The interest shown by the management of the different establishments under inspection, and their co-operation, have been of great assistance to your officers in the performance of their varied duties.

The percentage of losses sustained during the year by those whose establishments come within the operation of the Act shows a slight increase over that of the preceding seven months, yet it has been met with but little complaint.

The supply of hogs has been somewhat smaller than usual and prices have steadily advanced, yet this does not appear to any appreciable extent to have increased the production. Owing to this scarcity, together with the somewhat unsatisfactory condition of the British market, the export of Bacon and Hams shows a decided decrease as compared with the preceding year, but it is hoped that confidence on the part of our foreign purchasers may be maintained owing to the fact that the Meat and Canned Foods Act permits only the export of meat and meat food products which have passed Government Inspection.

A much better class of cattle is now being slaughtered in the various establishments: animals which might be looked upon with suspicion are passed by, the management not wishing to run the risk of their condemnation at the hands of your officers. The greatest change in this respect is noticed in the veal calves slaughtered, the percentage of immature animals presented falling approximately 33 per cent, a fact which affords a great deal of satisfaction and which will tend to produce in the public mind a greater confidence in the wholesomeness of this particular product. The pernicious practice during the past few years of placing on the market veal of questionable age and condition cannot be too strongly condemned.

In summing up the number of animals of the different classes slaughtered, I am somewhat surprised at the comparatively small number of sheep and lambs killed. A



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much greater demand for mutton would result were it generally known that these animals are found not to be affected with the diseases for which the majority of condemnations are made in the case of the other meat food animals.

On April 7, 1908, an examination, as provided by the Act, was held in Amherst, N. S., Montreal, P.Q., Ottawa, Toronto, and London, Ont., Winnipeg, Man., Regina, Sask., Calgary, Alta., and Vancouver, B.C., of which all veterinarians residing in Canada, whose addresses were known, were notified. Of the 100 candidates who wrote 23 were successful in obtaining the percentage of marks necessary in order that their names might be placed upon a list of those eligible for appointment as officers of this Division.

During the session of Parliament which prorogued early in 1908, amendments were made to the Act, the most important of which was, perhaps, the repealing of Section II and the substituting therefor of the present section which has the effect of bringing all establishments engaged in any way in export trade of meats or meat food products (unless exempted by the Governor in Council), within its operation.

As a result of this, sections 25 and 26 of the Regulations governing the Inspection of Meats which require the marking or certification of meats or meat food products passing from one province to another, or out of the Dominion, became operative.

Such being the case difficulties peculiar to conditions and established customs presented themselves.

In the maritime provinces the supply of beef and pork does not meet the demand consequently, there are no establishments, engaged in export trade, which do sufficient business to warrant the expense of placing an inspector therein.

The provinces are small in area and considerable trade between the mainland and the contiguous islands is carried on at certain periods by small dealers, which trade must have ceased when the Meat and Canned Foods Act was enforced unless carried on in accordance with this Act, and the regulations made thereunder. Hence it was deemed advisable to recommend to Council that the regulations be so amended as to permit the shipment without inspection, of fresh meat and fresh meat products from any one of the three maritime provinces to any other, or to Newfoundland, St. Pierre and Miquelon, or the Magdalen Islands, which recommendation was granted.

Again, the supply of mutton in the above-mentioned provinces is at certain seasons, in excess of the demand for local consumption, and for a number of years it has been shipped during the cold weather to various points in the west. To conserve this trade, and to assist those engaged in sheep raising, arrangements were completed whereby the slaughter of these animals was concentrated at Sussex and St. John, N.B., to which points regularly qualified and appointed officers of this branch were detailed in order to inspect all carcasses and to mark such as were found fit for food, an arrangement which proved satisfactory, not only to the buyer and seller but to the producer, who was thus enabled to obtain the highest price as the market was in no way a local one.

A similar condition of affairs presented itself in the counties of Essex and Kent, due to the custom, long established in that district, of farmers slaughtering their own animals during the fall and winter months, and selling the dressed carcasses to dealers who ship them, chiefly, to the province of Quebec. In order to preserve this trade, it became necessary to place inspectors at different shipping points, namely, Chatham, Harrow, Essex, Amherstburg and Oldeastle, a total of 12,338 hogs being inspected during the season just ended. Such an arrangement not only permitted this trade to continue but allowed all animals so inspected and marked by our inspectors to enter establishments under inspection, and thus created a larger market and keener competition than could otherwise have existed.

Considerable difficulty has been experienced in securing the observance by the transportation companies of the requirements of the Act and the Regulations made thereunder. Bearing in mind the extent of the Dominion, and the vast army of their employees, a great amount of leniency has been shown them, yet it became necessary



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to enter an action against one company, with the result that judgment was given in favour of this Department. This has produced a salutary effect upon the other companies.

On October 1st, 1908, the British Government, through the Local Government Board, brought into force, under the provisions of 'The Public Health Act, 1896,' the new 'Regulations governing the Importation of Foreign Meat,' which had the effect of prohibiting entirely meats of certain classes, of which very little (if any) was received from Canada. It also provided for the importation of other classes of meat under certain restrictions, the conditions of which could not have been met by Canadian exporters had 'The Meat and Canned Foods Act' not been in operation.

During the year four additional establishments were placed under inspection, and inspection was withdrawn from one owing to its destruction by fire.

During the year Mr. Russell Bowlby, a man thoroughly acquainted with the canned fruit and vegetables trade, was busily engaged in travelling from place to place throughout Canada, closely watching the sanitary conditions at establishments engaged in the canning of fruit and vegetables and manufacture of preserves, jams, jellies, pickles, etc., instructing the owners or managers as to the requirements of the Act, and making such suggestions as appeared to him necessary in order that such requirements might be more easily met and maintained. The great majority of the factories visited were in very fair condition, and those which were not found satisfactory on his first visit have since shown marked improvement.

Owing to the large number of houses engaged in this trade it was deemed advisable to appoint another Inspector to assist in the work. In September, 1908, Mr. F. E. N. Boulter, of Picton, a thoroughly qualified man who had been connected with the canning business since his boyhood, was appointed. The wisdom of this appointment was shown by his excellent work, he being detailed at first to look after Evaporators, some 79 of which he visited before the operations for the season closed. From his reports it appeared that many of these plants were not in the condition desired, yet it is gratifying to know that his suggestions were well received and in nearly all cases acted upon, and in such plants as he was able to revisit evidence of the co-operation of the management in securing cleanliness and proper sanitary conditions was plainly seen.

Your inspectors, having the experience of years of practical work in this trade, were able to offer suggestions, and impart information along several lines intimately associated with the work and in this way have been able to accomplish a great amount of good not only in raising the standard of the sanitary surroundings but in the quality and preparation of the products manufactured. The interest and the readiness exhibited by the management of the factories in complying with the demands and suggestions of your Inspectors attest to their hearty support of your endeavour to place the standard for canned foods upon a high plane, and thereby to dispel the lack of confidence which at the present time appears to exist in regard to the wholesomeness of such preparations.

I have the honour to be,

Sir,

Your obedient servant.

R. BARNES,

*Chief, Meat Inspection Division.*

The Veterinary Director General,  
Ottawa.



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## APPENDIX No. 3.

A. E. MOORE, D.V.S., *Chief Travelling Inspector.*

OTTAWA, March 31, 1909.

SIR,—I have the honour to submit to you this my annual report for the year ended March 31, 1909.

## GLANDERS.

During the year I have tested 103 horses with mallein, of which forty-one reacted and were destroyed.

I have dealt with only one serious outbreak of glanders this year. About the last of April, 1908, a large Railway Construction Company operating in northern Quebec, reported that they had recently lost a horse which their foreman thought was affected with farcy. I visited their camps accompanied by Dr. George Higginson, where we found eighty-two very valuable horses, some of which showed clinical symptoms of the disease. The whole lot, therefore, which were in four different camps, were tested with mallein, with the result that forty-one reacted and were immediately destroyed. The forty-one which did not react were closely quarantined and retested after an interval of thirty days, fortunately there were no more reactions.

I was unable to trace definitely the origin of this outbreak. There were, however, many American branded horses among them, which came over from Montana about three years ago, and it is possible that the disease was thus imported in its incipient stage. I made a close examination of other horses belonging to several smaller firms, and of private individuals which were near the infected camps but no evidence of glanders was seen.

From time to time when not engaged in travelling I have made systematic clinical inspections of the horses in the city of Ottawa. I have frequently visited the market, and have inspected the horses in about all the large stables and a great many of the smaller ones. Special attention was paid to the horses in the stables where outbreaks had occurred in past years. I am glad to report that I have not seen even a single suspicious case in this city during the year.

## SUSPECTED GLANDERS.

The following cases were reported, but on investigation I found the diseases to be other than glanders.

- 2 mares near Shawville, Que., suffering from irregular strangles.
- 1 horse near Merrickville, Ont., suffering from influenza.
- 1 horse near Lakefield, Ont., suffering from an ulcerated tooth.
- 1 horse at Mattawa, Ont., suffering from typhoid influenza.
- 1 horse near Belleville, Ont., suffering from nasal gleet.
- 1 horse at Blackburn Mines, Que., suffering from nasal gleet.
- 1 horse at Billings Bridge, Ont., suffering from nasal gleet.
- 1 horse at Bells Corners, Ont., suffering from distemper.

The other inspectors in Ontario and Quebec have also found that many of the suspected cases which they investigated proved not to be glanders.



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An inspector was sent into the Saguenay district again this year where he remained for some time and carefully inspected a great many horses in the six parishes where a house to house test was made three years ago. No further trace of the disease was found.

All of the above reports are very encouraging and certainly demonstrate that the disease is being eradicated. Since your present policy has been in force there has been no recurrence of the disease in any of the stables where serious outbreaks have been dealt with.

#### TESTING OF IMPORT HORSES FROM THE UNITED STATES.

April 20—Tested one mare from New York at Ottawa.

May 6—Tested one stallion from New York at Kingston.

May 7—Tested two geldings from New York at Kingston.

May 19—Tested one stallion from New York at Ottawa.

May 21—Tested one mare from New York at Kingston.

October 14—Tested two geldings from New York at Kingston.

November 7—Tested one gelding from Vermont at Ottawa.

There were no reactions.

#### TUBERCULOSIS.

I have tested 431 cattle, 104 of which were diseased and one suspicious. These cattle were in herds which are under the special supervision of this Branch.

I also assisted Dr. Hilton in testing 74 cattle at the Tuberculosis Experiment Station near Hull.

Three cattle were tested by me for export to the United States this year, all of which passed.

During the year I have twice inspected the herd at Hudson Heights which has been under my supervision for some time. The cattle appear to be in good health. I intend to retest them again this spring.

During the year I have earmarked reacting cattle at the following places:—

3 at Wakefield, Que.

1 at Bath, Ont.

7 at Vercheres, Que.

These cattle were tested by local veterinarians with tuberculine furnished by this department.

#### HOG CHOLERA.

In August it was reported that hogs were dying on a farm near Sudbury, Ontario. I visited this farm and found the disease to be hog cholera. As a result of the investigation twelve different places were quarantined and all the hogs thereon destroyed. I could not trace the exact origin of this outbreak although the disease started in two herds where uncooked hotel swill was being fed.

During the last of December, Inspector Willson, who is in charge of the meat inspection at Toronto, reported that he found lesions of hog cholera at one of the abattoirs in hogs which came from near Toronto. On investigation I found the disease in two places. There was no communication between these farms in any way, but both owners were feeding hotel swill which contained the intestines and crops of fowls, as well as uncooked pork refuse, etc.

In all of the above cases the hog cholera lesions were very well marked and were not confused with other lesions sometimes seen where hogs are fed on hotel swill. In every case there were the ulcerations on the bowels, the typical pneumonia, the hæmorrhagic condition of the glands, the petechia on the different organs and enlarged spleens.



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Several cases of suspected hog cholera were reported in different parts of the country. I found the unhealthy conditions were due either to improper feeding, bad hygienic conditions, intestinal worms or to verminous bronchitis.

## SHEEP SCAB.

Only three small outbreaks of sheep scab were discovered this year in the Eastern Provinces. A breeder in Simcoe Co. sold his flock of sheep which were slightly diseased to several farmers; most of the sheep were brought by his neighbours. One breeder in Ontario county, however, bought several and noticed evidence of scabies soon after they arrived on his farm. This breeder did not report his case to the Department but treated them unsuccessfully himself. He allowed them to come in contact with his neighbours' sheep, with the result that one flock became badly affected. This was reported to the Department by the local veterinarian. As a result of this Ontario County outbreak the sheep on ten farms were quarantined, two where disease was found and eight as contact. All of these sheep were dipped under my supervision.

Dr. J. H. Tennant was instructed to proceed to Simcoe county and visit the farmers who bought sheep from the flock where the disease originated. I visited this section and found that Dr. Tennant had made a thorough investigation. Fifteen farms were quarantined, on nine of which the disease was found and six as contact only. The sheep were all dipped under Dr. Tennant's supervision.

A small outbreak was also reported by Dr. Brown near Sarnia. Three farms were quarantined, there being only a few sheep on each farm.

Early this spring Drs. Tennant and Orchard assisted me in making a reinspection of all sheep on the different farms which have been quarantined for scabies during the last three years. On one farm only were found diseased sheep. The owner acknowledged that they were returned to an infected yard after they were dipped, contrary to the inspector's knowledge or orders, and thus became re-infected.

These sheep are now closely quarantined and will be dipped as soon as weather permits. We made a house to house inspection of all the sheep within a radius of five miles from these infected premises but no evidence of scabies was seen.

## ANTHRAX.

In August I visited two farms near Martintown, Ont., where I found cattle dying of anthrax. One farmer lost five head and the other lost one cow. On inquiry I learned that cattle had died, presumably of anthrax, on these farms years ago.

In September I was called to Rowena, Ontario, where I found that two cattle had died from anthrax contracted from grazing off an old anthrax grave which had not been properly fenced off.

In all these cases I had the carcasses burned, and advised vaccination of the remaining animals on these farms.

## MALNUTRITION IN CATTLE.

During the early spring of 1908 it was reported to your office at different times that many cattle were dying, especially along the St. Lawrence river from Toronto east to the Quebec boundary. After a careful investigation I found the cause of death primarily to be malnutrition. Lack of nutritious food naturally made them very weak as spring came on, and led to different disorders. Hay and feed were very expensive last year and many of the farmers were tempted to sell themselves short. Then they endeavoured to economize by feeding straw and other cheap non-succulent fodders to their cattle. Owing to the dry autumn of last year the fall pastures were very poor and the cattle went into their winter quarters unusually thin. They had therefore no surplus energy to sustain them, and consequently a large number died. As soon as the spring pastures came this trouble disappeared but many of the sur-



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vivors, especially milch cows, were very emaciated and were almost worthless for the whole season. In speaking to the veterinary practitioners in different parts of the country I was informed that this condition was very prevalent last spring.

This subject is an extremely important one as there are so many farmers who believe that if an animal only lives until spring her condition does not matter. Thousands of dollars are lost every year by the improper care of animals during the long winter months while they are obliged to be confined. Not only is the quantity and quality of food lacking, but the hygienic conditions in some cases are wretched. I repeatedly come across cases that should be dealt with by the Society for the Prevention of Cruelty to Animals, rather than the Health of Animals Branch of this Department.

#### BOUNDARY INSPECTION.

Acting on your instructions I have from time to time visited the boundary points between Canada and the United States for the purpose of facilitating the proper carrying out of the regulations, especially those related to the importation of horses, with the view of preventing the introduction of glanders into this country.

In August I visited Newport and St. Albans in the state of Vermont, for the purpose of ascertaining the condition of stock cars which are returned to Canada from Boston and Portland. I found as a result of this investigation that the cars were not being returned in very good condition, some were not even cleaned out and no attempt was made at disinfection. I drew the attention of those in charge on the United States side and they promised that they would carry out our regulations. After this, acting upon my instructions, our boundary officials refused admittance to several cars which were sent over improperly cleansed and disinfected. This resulted in the railway officials being more careful to comply with the regulations.

On January 14th, I visited the ports from Kingston to Cornwall to interview the officers who were placed there to guard against the introduction of foot and mouth disease from the United States. I found everything quite satisfactory.

On January 23rd, I visited Niagara Falls and Bridgeburg and interviewed all the officers at these ports. In consultation with Dr. Orchard I did not consider it necessary to have more than one officer at Niagara Falls. Consequently you recalled Dr. McKenzie who was assisting Dr. Watson.

#### PRECAUTIONS TAKEN TO PREVENT THE INTRODUCTION OF FOOT AND MOUTH DISEASE INTO CANADA, DURING THE RECENT OUTBREAK IN THE UNITED STATES.

During your absence and acting on instructions from Dr. Hilton, I visited Pennsylvania during the early part of the outbreak of foot and mouth disease in that state for the purpose of familiarizing myself with the mode of handling the disease by the United States authorities. I was shown the greatest courtesy by all the officers with whom I came into contact and given every possible chance to obtain the information I desired.

On my return to Ottawa I was instructed to proceed immediately to Toronto and to supervise the inspection of all the live stock which arrived in that city, also to arrange with the railways for the disinfection of all stock cars arriving in the city regardless of their origin or destination. I was also instructed to obtain the services of some of the local veterinarians for the purpose of making house to house inspections of live stock in the Niagara Peninsula and the townships around the city of Toronto.

I arrived in Toronto on November 25th and immediately placed men in the townships along the Niagara river and instructed them to make a systematic inspection of all the live stock in these townships and to be constantly on the look out for recent importations from the States. At this time the outbreaks at Buffalo and Niagara Falls, N.Y. were being dealt with and there was the greatest danger of introducing foot and mouth disease into Canada owing to its close proximity. After keeping the men in



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these townships until the outbreak was under control on the United States side, I then placed them along the lines of the Grand Trunk and Michigan Central Railroads on the north shore of Lake Erie, these lines being the great highways for the American live stock transit trade.

After making a careful inspection of nearly 400,000 animals no evidence of any contagious disease was found.

Dr. E. C. Oliver was constantly on duty at the Toronto stock yards and examined daily all the cattle, sheep and swine that came into the city; he also superintended the disinfection of the stock yards, which was done in a very thorough manner.

Merchandise packed in hay and straw from the quarantined states was constantly coming, in bond, into Toronto in spite of the diligence of the officers at the boundary. These goods were in boxes and barrels and these packages had to be opened to find out the nature of the packing; this involved a great amount of work. Dr. Wm. Stubbs ably supervised this work as well as that of the disinfection of stock cars until other duties demanded his attention. I then recommended the appointment of two lay inspectors which was necessary to properly carry out this work.

On January 8th according to your instructions I recalled all the veterinarians working under me, and returned to Ottawa on January 12th.

I have the honour to be,

Sir,

Your obedient servant,

A. E. MOORE,  
*Chief Travelling Inspector.*

The Veterinary Director General,  
Ottawa.



APPENDIX No. 4.

C. D. MCGILVRAY, M.D.V.

WINNIPEG, March 31st, 1909.

SIR,—I have the honour to submit herewith report in connection with the Health of Animals' Branch in the province of Manitoba for the year ending March 31st, 1909.

The work of the Branch here may, for convenience, be considered under the following divisions:—

*Health of Animals Branch.*—Diseases Control Division, Quarantine Inspection Division, Meat Inspection Division.

DISEASES CONTROL DIVISION.

The work of the various officers here, engaged in this division of the Branch, has consisted in dealing with the control and eradication of diseases coming under the Contagious Diseases of Animals Act, and the enforcement and carrying out of the various requirements and regulations relating thereto.

*Glanders.*—While our efforts toward the control and eradication of this disease have been marked by a very noticeable decrease in the number of outbreaks detected and dealt with, and corresponding decrease in number of animals found to be affected and destroyed, it still remains, however, the most important disease engaging our attention.

During the past year, I have inspected and submitted to the mallein test, and destroyed, for glanders, the following number of horses and mules:—

164 were submitted to a first mallein test (this number includes 21 in the province of Ontario).

49 were submitted to a second mallein test (this number includes 12 in the province of Ontario).

30 { 24 were destroyed as a result of re-action to a first mallein test (including 8 in the province of Ontario).  
3 were destroyed as a result of re-action to second mallein test (including 2 in the province of Ontario).  
3 were destroyed on inspection without test.

Out of this total of 30 horses destroyed, 14 showed clinical symptoms.

*Import Horses tested in addition to above.*

77 were submitted to a first mallein test, at destination.

2 were submitted to a second mallein test, at destination.

11 were submitted to a first mallein test at boundary (Snowflake) of which 1 reacted and was refused entry.

*Glanders Statistics for Manitoba.*

Summary showing total number of horses and mules tested and destroyed during year:—

Horses and mules submitted to test—

1st test.. . . . .	989
2nd test.. . . . .	208
3rd test.. . . . .	32



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## Horses and mules destroyed for glanders—

1st test.. . . .	95
2nd test.. . . .	10
3rd test.. . . .	1
Without test.. . . .	4

Total.. . . . 110

Total compensation allowed \$9,304.95, being an average of \$84.59 each.

*Import horses and mules tested at destination.*

1st test.. . . .	330
2nd test.. . . .	84
3rd test.. . . .	22
4th test.. . . .	14

*Import horses and mules which reacted to test and were destroyed without compensation.*

1st test.. . . .	5
2nd test.. . . .	7
3rd test.. . . .	1
4th test.. . . .	1

Total.. . . . 14

No. of import horses remaining untested in Province on March 31st, 1909, is 51.

## MANGE OF HORSES.

This disease is still found affecting horses in isolated cases at widely separated points. During the past year I detected mange affecting 2 horses, which were placed under quarantine restrictions.

The total number of horses placed under quarantine restrictions for mange by the various officers here during the past year comprised 65 of which 39 were showing symptoms of mange, the remainder being contact horses. Full information and instructions as to satisfactory treatment of affected animals and disinfection of premises were furnished to owners of affected animals. The disease is readily amenable to treatment, that recommended by the Department being very satisfactory.

## MANGE OF CATTLE.

In accordance with the requirements of the Special Mange Order all cattle originating West of Winnipeg are inspected at the Stock Yards here, and any cattle showing indications of mange are detained and are allowed to be removed only for immediate slaughter. While mange is still found to exist among cattle coming from the mange area, as yet we have not detected mange in cattle coming from points in Manitoba or from points in Alberta and Saskatchewan outside of the mange area. Cattle destined for points East of Winnipeg, are only allowed to go forward after being inspected, and under the inspector's certificate. Infected yards are cleansed and disinfected from time to time as exigencies require. Cars which have carried cattle coming from the mange area, and having Winnipeg as their destination point, are cleansed and disinfected with limewash and carbolic acid before being allowed to return for purposes of ordinary traffic.



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During the past year, the following number of cattle were inspected at the Winnipeg Stock Yards:—

Destined for points East of Winnipeg and intended for export.. . . . .	105,661
For local consumption, having Winnipeg for destination	61,912
Total.. . . . .	167,573

Of this number 69 were found to be affected with mange.

#### DOURINE.

This disease has not, as yet, been detected affecting horses in this province, though, from time to time, our inspectors have inspected horses suspected of this disease, but which, upon examination, have proved to be suffering from some benign affection and not dourine.

#### HOG CHOLERA.

This disease was reported as being in existence on a farm in the Deloraine district, by the local veterinarian. At the time of visit three hogs were found on the premises which appeared quite healthy, but prior to time of visit 15 hogs had been destroyed on the initiative of the owner and attending veterinarian, for alleged cholera. Close inquiry could elicit no information as to a possible source of infection, no cholera having ever been known to have been in existence in the district. The three remaining hogs were placed under close quarantine restrictions, and were subsequently inspected at regular intervals, until a period of four months had elapsed, without developing indications of the disease, hence the restrictions were removed.

#### TUBERCULOSIS.

During the past year, I have submitted 1 pure bred Shorthorn bull, intended for export to the United States, to the tuberculin test which proved healthy. Four others were also inspected by one of our inspectors making a total of five tested for export, all of which proved healthy.

288 cattle were tested in the province by private practising veterinarians with tuberculin supplied by the Department. 125 re-acted and were earmarked in accordance with the regulations, by a regular officer of this Branch.

40 head of cattle were tested by one of our officers at the Brandon Experimental Farm, all of which proved healthy.

#### RABIES.

This disease was reported as affecting dogs in the Kirkella district, a dog being reported to us as showing symptoms of rabies which, prior to having been destroyed, had bitten a number of other dogs. I visited the district referred to and destroyed all dogs reported to have been bitten by the suspected rabid animal. I also removed the brain from the suspected dog, and forwarded same to the Biological Laboratory at Ottawa for inoculation purposes, the pathologist subsequently reporting same as being negative. Under the circumstances, therefore, no further action was taken.

#### BLACK-LEG.

This disease is reported from time to time from certain sections of the province, where it appears to be more or less indigenous. When the true nature of the disease is established no action is taken by us other than recommend owners to resort to protective inoculation of susceptible animals, and their removal from infected



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pastures and the proper disposal of any carcasses of animals which may have died from the disease. During the past year we have supplied 200 doses of black-leg vaccine to owners for vaccination purposes.

## QUARANTINE INSPECTION DIVISION.

This division of the work consists in the enforcement and carrying out of the requirements and regulations relating to Animals' Quarantine, by regular officers of the Branch, stationed at the various Animals' Quarantine Stations, which, in Manitoba are at Emerson, Gretna and Bannerman.

At each of these Quarantine Stations the equipment consists of a substantial fenced inclosure and commodious comfortable stable accommodation, which is well lighted and thoroughly ventilated. During the past year the stables at each of the Quarantine Stations have been painted on the outside, the work being done by the caretaker, so that the stables present a neat appearance. At regular intervals, and as the exigencies require, the inside of the stables are cleansed and disinfected with limewash and carbolic acid.

All horses and mules coming from the United States, being presented for entry and inspection at the various quarantine stations here, must be accompanied by a satisfactory certificate of mallein test, in accordance with the regulations, otherwise they are detained and submitted to the test by our officers at boundary points, or, in exceptional cases, under certain restrictions, at destination. It sometimes happens, during the Spring rush of immigration, the accommodation available is not sufficient to permit all horses being tested at Quarantine Stations without causing considerable delay to incoming settlers. Under such exceptional circumstances, some entries, after careful inspection, are allowed to proceed to destination under special license, conditional that they be kept available for subsequent submission to mallein test by officers of the Department.

*Emerson Quarantine Station.*

This station is situated at Emerson, on the International boundary line, at a point where the Canadian Northern and Canadian Pacific lines of railway, and their American connections intersect each other. The equipment consists of a fenced inclosure 205 feet in length by 100 feet wide; stable 100 ft. x 30 ft., which provides comfortable accommodation for 45 animals. There is also a covered in shed, completely isolated which is used for the detention of hogs during the required period of quarantine.

Owing to the large number of horses and mules being presented for entry and inspection at this station, and which we were desirous of having submitted to the mallein test at boundary, it was necessary commencing with March 1, 1909, to rent a separate stable, providing increased accommodation for 25 horses.

During the past year there has been presented for entry and inspection the following number of animals:—

Horses.. . . .	4,289
Mules.. . . .	663
Cattle.. . . .	1,343
Sheep and goats.. . . .	134
Swine.. . . .	10
Fees collected .. . . .	\$713.75

2,659 horses and mules were submitted to the mallein test, of which 27 reacted and were refused entry.

Twenty-one head of cattle were submitted to the tuberculin test, of which one reacted and was refused entry.



*Gretna Quarantine Station.*

This station is situated on the International boundary line at Gretna where it is conveniently placed equi-distant between the Midland branch of the Great Northern and Canadian Pacific lines of railway, each of which lines has a branch spur running into the quarantine station. The equipment consists of a substantially fenced inclosure 140 ft. in length by 120 ft. wide. Stable 100 ft. by 30 ft. providing comfortable accommodation for 45 animals, which is well lighted and thoroughly ventilated.

During the past year there has been presented for entry and inspection the following number of animals:—

Horses.. . . . .	1,047
Mules.. . . . .	172
Cattle.. . . . .	483
Sheep and goats.. . . . .	117
Swine . . . . .	Nil.
Fees collected.. . . . .	\$152.71

869 horses and mules were submitted to the mallein test, of which 12 reacted and were refused entry.

One head of cattle was submitted to the tuberculin test, which proved healthy.

*Bannerman Quarantine Station.*

This station is situated on the B. S. & H. B. branch of the Great Northern line of railway at Bannerman, distant from the International boundary line about three and a half miles.

The equipment consists of a substantially fenced inclosure 140 ft. in length by 120 ft. wide. Stable 100 ft by 30 ft. providing comfortable accommodation for 45 animals which is well lighted and thoroughly ventilated.

During the past year there has been presented for entry and inspection the following number of animals:—

Horses.. . . . .	345
Mules.. . . . .	2
Cattle.. . . . .	136
Sheep and goats.. . . . .	Nil.
Swine.. . . . .	Nil.
Fees collected . . . . .	\$92.60

189 horses and mules were submitted to the mallein test, of which 12 reacted and were refused entry.

23 head of cattle were submitted to the tuberculin test, all of which proved healthy.

*Snowflake and Mowbray.*

During the spring rush of immigration in the past year, there was also presented for entry and inspection at these points the following animals:—

Horses.. . . . .	46
Cattle.. . . . .	23

All of the horses presented for entry and inspection at these points were submitted to the mallein test, of which three reacted and were refused entry and returned to the United States.

SPRAGUE.

During the past year the following animals were presented for entry and inspection at Sprague:—4 horses, 12 cattle, 32 sheep.

The 4 horses were submitted to the mallein test and were found to react, hence were refused entry and returned to the United States.



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*Summary showing total number of animals presented for entry and inspection at the various boundary points.*

Horses and mules inspected.. . . .	6,568
Horses and mules tested.. . . .	3,767
Horses and mules reacting and refused entry.. . . .	58
Cattle inspected.. . . .	1,997
Cattle tested.. . . .	45
Cattle reacting and refused entry.. . . .	1
Sheep and goats inspected.. . . .	283
Swine inspected.. . . .	10
Fees collected.. . . .	\$959.06

## MEAT INSPECTION DIVISION.

This division of the work consists in the carrying out of the various requirements of the Meat and Canned Foods Act, and the regulations relating thereto.

Inspection is maintained at four establishments here, which are engaged in an export trade in meat or the products thereof, viz:—

J. Y. Griffin Co., known as establishment.. . . .	No. 18
Gordon, Ironsides & Fares, known as establishment.. . . .	No. 19
Gallagher, Holman & LaFrance, known as establishment.. . . .	No. 20
The Western Packing Co, known as establishment.. . . .	No. 21

Ten inspectors are stationed here; three being located at each of the Establishments Nos. 18, 19 and 20, and one at establishment No. 21.

The entire time of the inspectors is devoted to this work, which consists of the ante-mortem and careful post-mortem examination of all animals intended for, or slaughtered, at these establishments, and which are dealt with in accordance with the requirements of the regulations. Close vigilance is also exercised by the inspectors over the sanitary conditions existing within the establishments, and the general cleanliness of employees and plant equipment engaged in the preparation of the various food products.

As a result of the inauguration of this service, and the effective work of our inspectors in carrying out the regulations, a very great improvement is noticeable in the sanitary conditions of the various establishments under inspection.

The necessity and importance of this work is simplified and demonstrated, from time to time, by the detection and condemnation of diseased animals by our inspectors, as a result of which the public are being largely safe-guarded from unwholesome and diseased food products.

All of which is respectfully submitted.

I have the honour to be, Sir,

Your obedient servant,

C. D. McGILVRAY,

*Inspector.*

The Veterinary Director General,  
Ottawa.



## APPENDIX No. 5.

ARTHUR G. HOPKINS, B.S.A., M.D.V.

REGINA, Sask., March 31, 1909.

SIR,—I have the honour to submit herewith my Annual Report for the year ending March 31, 1909.

From the beginning of the present fiscal year until April 9, I was at Ottawa, acting as your chief assistant, vice Dr. Hilton, who was in Regina organizing the work of the Health of Animals Branch in Alberta and Saskatchewan. On April 9, in conformance with your instructions, I left Ottawa for Regina to relieve Dr. Hilton, and was placed in charge of the work of the Branch in Saskatchewan. The work during the year has been arduous and exacting, due largely to the large number of import horses from the United States which had to be tested with mallein in addition to the handling of outbreaks of contagious diseases.

The reports of the individual officers at the boundary ports reveal the number of horses and mules which reacted to the mallein test and were therefore refused entry into Canada as being affected with glanders.

The staff under my charge in the field and at Regina has fluctuated in numbers due to various reasons, thereby increasing my responsibility and duties. Inspectors Head and Gebbie were employed in the East for three and a half months on patrol work along the International boundary against a possible invasion of Foot and Mouth disease, fortunately averted, Inspector Gray on leave of absence, Inspector Henderson temporarily and the office clerk permanently, being relieved from duty. Inspector Ayre has, in addition to occasional field work, shared with Miss Cresswell, my stenographer, the office work, and the work has been well and satisfactorily done in spite of the increased work thus placed upon their shoulders. In May last the staff was increased temporarily by Dr. R. G. Matthews being stationed at Maple Creek and given charge of the work with mange, supervising the work of Range Riders and dipping, and permanently by Inspectors H. W. Mustard and J. Fielding Cottrill, each doing good work in his particular sphere of labour. The older members of the staff are well known to you and it is unnecessary for me to refer to their work, the official records revealing ample testimony on that score. The general health of live stock in the province of Saskatchewan is good; occasionally I receive reports of cases of swamp fever, and frequently hear of severe visitations of typhoid influenza, or malarial fever in horses, this latter disease being either knowingly or unwittingly confused in some cases by practitioners with swamp fever. Navel-ill is also a cause of severe mortality in some of the noted studs of pure bred horses, which this province is noted for and is fortunate to possess. Outbreaks of blackleg have been reported from several localities. Vaccination has been advised in all cases, and vaccine supplied from the Ottawa laboratory at the regulation price of five cents per dose to owners applying for it. The vaccine has evidently given satisfaction wherever used, as not a single complaint has been received regarding it at this office.

## GLANDERS.

This is the most important disease the Branch has had to deal with during the past year. Settlers' horses from the south have for years past contributed largely to the outbreaks of the disease in the prairie provinces, particularly Saskatchewan. Hitherto horses have been inspected at North Portal and as many tested as could be



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by the Inspector stationed there, and those untested allowed to proceed to destination, being then followed up by the field officers of the Branch. This method while undoubtedly better than no testing, was costly to the Department, and might occasionally result in apparent hardships to a settler, for if his horses are found affected, the diseased ones are slaughtered without compensation, his teams broken and his working force badly disarranged, while if tested and rejected at the boundary he has an opportunity of perhaps securing redress and possibly making good his loss. Under your instructions I augmented the force of inspectors at North Portal by transferring Inspectors Cottril and Gebbie there to assist Inspector Mitchell. I also arranged with the Inspector in charge at North Portal to notify the Regina office by wire of carload lots or large consignments permitted to proceed to destination, with a view to having an Inspector meet the shipments at the unloading point, there testing the horses before proceeding twenty, fifty or more miles to their homesteads; this was not found to be a perfect arrangement with the limited number of Inspectors under my charge, and again at your suggestion a change was made so that shipments west of Moosejaw via the C. P. R. main line were tested at that point. The resident Inspector, Dr. J. C. McMurtry, was given help as needed, aid being rendered by Inspectors Ayre, Head, Henderson, Mountford and Ovens, as the exigencies of the situation demanded. As a consequence very few untested horses were permitted to go forward to destination; several reactors were destroyed at Moosejaw, a most difficult procedure, and one requiring much firmness and tact with owners unacquainted with the methods of the Branch in dealing with glanders in Canada; each case was well handled and the prospect of subsequent outbreaks of the disease with the consequent severe loss to all concerned, reduced to the minimum. If I may be permitted to make a suggestion, it would be to the effect that increased accommodation be afforded at the boundary for testing, so that reactors when found may be returned across the line. The necessary delay of twenty-four hours in order to test at the boundary point is no hardship but a decided benefit to the incoming settler and his live stock, the stock has a chance to rest and the settler, unless in exceptional cases, goes forward to destination with his mind at rest on the score of disease in his horses and mules. I note an increasing respect for and belief in the reliability of mallein by the profession and the laity in this province.

## ANTHRAX.

Fortunately no authenticated cases of this disease have to be reported.

## MALADIE DU COIT (DOURINE).

A small outbreak of this disease was reported by Inspector Gray in the Battle Creek and Coulee district, south of Maple Creek. Inspectors Hargrave, Matthews and myself proceeded to the districts and examined the suspect and confirmed the diagnosis. The affected ones were slaughtered and contacts and suspects quarantined and have not yet been released; examinations have been made of these animals periodically by Inspectors Gray and Hawke.

## MANGE.

Last summer Inspector Matthews with several range riders notified the owners of mange-affected and contact stock regarding the mange regulations, and had carried out under their supervision dipping with the lime and sulphur dip. Dr. Matthews relinquished his work later, but reports were received all winter from Range Riders Donegan, Reesor, and Stirling from which it is apparent that the disease is well under control and the cattle in a far better condition as a consequence. In March, in accordance with your instructions the control of the work of dealing with mange in that portion of the mange area in Saskatchewan was transferred to Dr. Hargrave,



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Medicine Hat. In this connection cars containing stock from the mange area to points outside in Saskatchewan have been disinfected by the railroad authorities and inspected by our officers.

#### TUBERCULOSIS.

Tuberculin has been supplied to veterinarians gratis at the request of their clients and reports received. During December I proceeded to the Experimental Farm, Indian Head, and submitted the cattle there, 49 head in all to the tuberculin test, one reactor, a purchased steer being obtained; this animal was later slaughtered.

#### RABIES.

Several reports of suspected rabies have been received, and investigations made by Inspectors Ayre, Cottrill, Head and myself, in the Moosomin, Fleming and Carn-duff districts. Material from the brains of several dogs was forwarded in glycerine to Dr. Gordon Bell, of Winnipeg, Provincial Bacteriologist for Manitoba and to the Pathologist, Biological Laboratory, Ottawa, but the diagnosis was not confirmed in all cases. The Provincial Bacteriologist of Saskatchewan, Dr. G. A. Charlton, has also examined specimens and obtained positive results. It would seem that the brain material from a rabid animal loses its virulency or deteriorates in some way so that a positive diagnosis may be obtained from one half of a brain, and a negative from the other half. Several human patients have been sent during the year to the United States for treatment against rabies at a Pasteur Institute, although it is doubtful if in any one of the cases it was determined that the offending dog was rabid. All of which is respectfully submitted.

I have the honour to be,

Sir,

Your obedient servant,

A. G. HOPKINS.

The Veterinary Director General,  
Ottawa.



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## APPENDIX No. 6.

J. C. HARGRAVE, D.V.S.

MEDICINE HAT, Alta., March 31st, 1909.

S R,—I have the honour to submit herewith my first annual report, as Inspector in charge, for the province of Alberta.

Until May last, 1908, the work of the Branch in the two western Prairie Provinces was directed from one office by Dr. Geo. Hilton at Regina, on which date they were separated and an office for Alberta established at this point.

Since assuming charge of the province of Alberta my time has been fully occupied, as aside from the ordinary detail work of the office, it has been necessary to make several visits to the different parts of the province, to meet and keep in close touch with each one of the staff, exercising a general, executive control of the inspections necessary throughout the province, and to give considerable time to field work on Mange and Dourine.

Shortly after the event of taking charge I accompanied Dr. Hopkins in attendance at the Maple Creek Stock Growers' Association. Was also present at the Western Stock Growers' Meeting; at both of which, matters relating to the Mange regulations and the intended action of the Department during the future were discussed.

On the 20th May, I attended the meetings of the different Breeders' Associations in Calgary.

In January, a meeting of the Central Stock Growers' Association was held in Stettler; at which meeting I was in attendance and discussed with them at some length, a number of matters relative to our work.

During May and June, I devoted considerable time to field work on *Maladie du Coit*, examining in the neighbourhood of 3,000 horses as gathered by the roundups, which necessitated a number of trips to various parts of South-Eastern Alberta; finding a few cases that required to be destroyed.

In connection with this work, visits were also made to Maple Creek and Maymont in Saskatchewan, and to Edmonton, Bowden, Calgary, Strathmore, Gleichen, the Red Deer river and the Cypress Hills, in Alberta.

In July, an outbreak discovered immediately East of the 4th Meridian, in Saskatchewan, was dealt with in company with Drs. Hopkins and Mathews; and again in November a trip was made with Dr. Hopkins to Maymont, to examine an animal that had been exposed to the disease before leaving Alberta.

Practically all Horse mange in the Medicine Hat district received my personal attention, necessitating repeated visits South of the Cypress Hills, in which area, a number of large herds were affected, also on the Red Deer river and in the vicinity of Irvine.

I am pleased to report that this district is almost free from the disease, there only being two premises now in quarantine and on these I think it has been successfully eradicated.

Although an endeavour has been made to have an Inspector available to make inspections of stock shipments in the south-eastern part of the province, yet it was not always possible and I found it necessary to make some 70 inspections comprising some 1,200 horses and 250 cattle. As arranged by yourself, I visited Winnipeg in March and there met Dr. Hilton, where matters pertaining to the three western provinces were taken up by him with Drs. Hopkins, McGilvray and myself.



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During the first half of the year I had three Inspectors who made their headquarters at Medicine Hat, these were Inspectors White, Nyblett and Hawke. The major portion of Inspector Hawke's time was given to Dourine work, while Inspectors White and Nyblett devoted considerable time to the testing of settlers' horses.

Early in July Inspector Patton who had charge of the port of Coutts was taken to the Lethbridge Hospital where his recovery was despaired of for some time; after two months illness he was able to return to duty, although not fully recovered.

During his absence from Coutts Inspector White was placed in charge, later he relieved Inspector Pinhorn at Pendant d'Oreille for two weeks and on Inspector Gallivan leaving for quarantine work in Ontario—where he remained for over two months—he took charge of the Lethbridge district.

Owing to the amount of work to be attended to in the Lacombe and Stettler districts I, with your permission, removed Inspector Nyblett from Medicine Hat to Lacombe the 1st October, also placing him in charge of Mange district No. 13, this I think, being more practical than handling that district from Medicine Hat which up to that time I had endeavored to do.

Until late in the Fall Inspector Riddell had charge of Mange district No. 10, but it was found that his whole time was taken up with inspections of shipments at railway points and he was unable to give the attention necessary to Mange work; the district was then given to Inspector McKay whose old district No. 12, in which there was practically no mange, was divided between himself and Inspector McVeigh. This arrangement allowed Inspector Riddell more freedom so that his services were available for special duties throughout the province, and also allowed of his proceeding to Missoula with Superintendent Douglas to inspect the buffalo purchased by the Dominion Government.

As you are aware, the resignation of Dr. Warnock was handed in during March, necessitated by his accepting the nomination for the Pincher Creek Constituency. This is most regrettable as he was one of the four Inspectors authorized to deal with Dourine; with which disease he has had a large experience and has, I think successfully eradicated it from the district of Pincher Creek and the Porcupine Hills.

The reports received from some of our officers throughout the provinces indicate duties of a most arduous nature, involving as they do, long journeys and in the newly settled districts considerable exposure, more especially while testing settlers' horses; a great deal of which was done.

The work throughout the province has been heavy and with the staff available—large though it appears—has not always been kept up to date. In fact there remains to be tested an exceedingly large number of settlers' horses that will keep our officers actively engaged for some time.

Following are detail statements, in brief, of the work done by your branch in connection with various contagious and infectious diseases.

#### MALADIE DU COIT.

From the reports and information at present available one is, I think, comparatively safe in saying that it is well in hand and the number slaughtered during the past year would indicate that in a very short time it will have been successfully eradicated. This is probably too strong a statement to make considering the insidious nature of the disease.

The policy followed, however, is such as to prevent any possible chance of animals suspected of spreading the infection. Any animal, against which the slightest suspicion exists, is at once rigidly quarantined for a period of from one to two years and examined at least once every three months.

There is, however, one or two districts sparsely settled, in which there are a large number of stray unreclaimed horses running at large and where possibly, infected animals still exist. These areas have, however, during the past year, been ridden by



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the range riders repeatedly and only in that district south and east of Lethbridge have animals at large been found infected. Small outbreaks were during the year discovered in districts where it had previously been prevalent; these totalled four in number.

One occurred near Olds; one south of Lethbridge and two south and east of Medicine Hat; the one being just east of the 4th meridian within the border of Saskatchewan. The latter outbreak was discovered by Inspector Grey of the Saskatchewan force in June, and is, I believe, the first time it has occurred in that province. Stock under range conditions roam indiscriminately over a large area, but in this case suspicion as to the probable source of infection, pointed strongly to a band of horses moved from near Coutts.

The following inspectors with myself are authorized to deal with this disease:—

Dr. Warnock, Dr. Busselle, Dr. Gallivan, Dr. Hawke.

These have during the year devoted a great deal of time to dourine inspections and a large number of horses have been examined.

The bands of horses gathered by the various roundups in the southern part of Alberta were all examined.

The following are the Alberta figures for the twelve months ending March 31, 1909:—

Number slaughtered.. . . .	28
Value .. . . .	\$3,160.00
Compensation .. . . .	\$2,108.64
Number suspected and quarantined .. . . .	237

Inspector Hawke has also devoted considerable time to dourine inspections in Saskatchewan where some five head were detected and slaughtered.

*Statistics for Saskatchewan.*

Number slaughtered.. . . .	5
Value.. . . .	\$600
Compensation.. . . .	\$400
Number suspected and quarantined.. . . .	44

At the present time I believe that the infected areas have not increased and I believe that the Mayton outbreak is cleaned up.

In a few of the suspected districts the horses are only gathered once a year and although examined then, still the difficulty of thoroughly examining unbroken animals is such, that one can never be sure that all infected animals have been isolated, consequently a greater length of time must elapse before it is definitely known whether such areas have been freed from the disease.

## GLANDERS.

Glanders in this province is, I think, more prevalent. In fact, I am satisfied that there is a great deal more of it than the statistics would indicate; but owing to the constant demand upon the services of the Inspectors in dealing with the Mange situation, it has not been possible to devote as much time to this disease as the nature of it warrants, nor has it been possible for officers to remain sufficiently long enough in an infected district, to trace up contacts, before it becomes necessary to investigate some other urgent case. The difficulty in dealing with an outbreak among range horses is such that it is never satisfactorily completed and the reactions obtained on testing wild, unbroken horses are generally very irregular and indefinite; so much so, that it requires an officer with a natural ability or one might say "instinct" to correctly interpret them.



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Fortunately the ranching area is rapidly lessening and once given to farming, or mixed farming, a better opportunity will be afforded to handle this disease in a systematic manner.

It is also much more difficult to successfully trace the source of infection under range conditions.

A somewhat extensive outbreak in the country to the south of the Cypress hills was discovered by Inspector Pinhorn and directly traceable to a horse from Montana.

The permitting of settlers' horses to proceed to destinations untested necessitated a great amount of work and unfortunately a number were lost track of entirely, and could not be found. The search for these often resulted in long, profitless journeys and occupied the major portion of our Inspector's time.

The fact that a number of reactors was found demonstrates the wisdom of this requirement and it is with regret that I have to report such a large number of these untested.

The testing of all settlers' horses at the several ports of entry, now required, will permit of the Inspectors dealing at more length with Glanders among native horses.

The following figures give the number of horses tested with Mallein and the number destroyed for Glanders for the year:—

CANADIAN HORSES.

Tested once.. . . . .	1,465
“ second time.. . . . .	497
“ third time.. . . . .	116
Destroyed on first test.. . . . .	158
“ “ second test.. . . . .	22
“ “ third test.. . . . .	2
“ without test.. . . . .	2

SETTLERS' HORSES.

Tested once.. . . . .	1,651
“ second time.. . . . .	167
“ third time.. . . . .	33
Destroyed on first test.. . . . .	21
“ on second test.. . . . .	18
Total value of 183 Canadian horses slaughtered . . . . .	\$19,933.00
Compensation.. . . . .	\$13,288.52

MANGE.

It is possible to report a well marked decrease in the number of outbreaks of horse mange. In consequence of the stringent measures adopted for its suppression, it has entirely disappeared from many districts where it formerly prevailed; this is without doubt due to the fact that what herds were affected were easily confined within pastures, thus preventing the spread of the disease and permitting the absolute control of the stock when being treated. The majority of owners are now more familiar with its characteristics and keep a closer supervision over their herds.

Would that I were able to report as favourable a situation with respect to cattle mange. This disease demanding as it does the greater part of our Inspector's time, is the most prevalent of the contagious diseases and is a constant source of worry and annoyance, to say nothing of the large expense to your Department. While unable to say that it has been handled successfully, yet the result of the year's work is satisfactory and in some districts encouraging; and although unable to declare that any particular district is free from mange, yet a number of large herds once badly infected



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are now free from it; although owing to range conditions they may become reinfected.

The policy outlined by you a year ago has been closely followed in almost every detail, and has, I think, been demonstrated to be practical and to meet the approval and hearty co-operation of the stock men.

The infected area was subdivided as before into eleven districts with an Inspector in charge of each; the boundaries of which were during the summer slightly changed. In October, Inspector McKay was given district No. 10, and Inspector Nyblett placed in charge of district No. 13. District No. 12 was subdivided between Inspectors McKay and McVeigh. Deputy Inspectors are constantly examining the stock at large and in inclosures in order to detect at the earliest possible moment an infected animal.

The lime and sulphur mixture, when properly prepared continues to give results that no other preparation does and stockmen who were opposed to its use, now wish for no other.

It is, however, a difficult matter to convince a large number of the necessity of the second dipping, which coupled with the difficulty of controlling stock during the interval, often results in situations extremely annoying.

Statistics for cattle mange, year ending March 31st, 1909.

Herds quarantined.. . . .	618
No. cattle.. . . .	181,515
Dipped in lime and sulphur.. . . .	145,152
Hand treated.. . . .	2,076
Statistics for horse mange year ending March 31st, 1909:—	
No. horses quarantined.. . . .	2,828
No. affected.. . . .	277
Dipped in lime and sulphur.. . . .	4,439
Hand treated.. . . .	145

## TUBERCULOSIS.

As a result of the Tuberculin test applied by private veterinarians with Tuberculin supplied by the Department forty-eight (48) head re-acted, thirty-four of which were ear-marked by Inspector McKay in accordance with the regulations, the balance, fourteen, were slaughtered.

## ANTHRAX.

No cases of this disease have been detected in this province during the past year.

## BLACK QUARTER.

A number of cases have been reported from the northern portion of the province but it has prevailed to a very slight extent. The practice of preventive vaccination continues to be adopted to some extent, the office having disposed of 550 doses of Blackleg Vaccine.

## RABIES.

I regret to have to report that this disease made its appearance within the province during the year, Inspector Nyblett having detected it in Red Deer and Innisfail during March; and Dr. Revell, the provincial bacteriologist, obtained positive results from microscopical examinations from substance taken from a suspected case. The source of infection at this date had not been determined. This outbreak is being promptly dealt with and a large area immediately surrounding the two points above mentioned, has been placed under the operation of an Order dated the 23rd March, 1909, and all dogs are effectively chained, and unclaimed or estray dogs are at once destroyed.



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## SHEEP SCAB.

This disease at one time very prevalent in this province is now extinct. The sheep men have, however, as a result of past experiences, acted on the defensive and each year dip their flocks.

## ACTINOMYCOISIS.

Reports have frequently been received as to the existence of the disease, more particularly from the mixed farming sections, but not to any serious extent.

As your Department does not deal with it, the complaints are referred to their respective Local Boards of Health, the only action taken by your officers being to prevent their shipment.

## QUARANTINE STATIONS.

In the province these are three in number:—

Twin Lakes with Inspector Christie in charge.

Coutts with Inspector Patton in charge.

Pendant d'Oreille with Inspector Pinhorn in charge.

At Pendant d'Oreille three (3) reactors and twelve (12) contacts were refused admission.

At Twin Lakes nine (9) reactors and fifteen (15) contacts were refused admission and at Coutts twenty-two (22) reactors and thirty-two (32) contacts were returned to the United States.

## INSPECTION OF STOCK, CARS AND YARDS.

The latter is attended to by James F. Robb who has succeeded in having them kept clean and in a sanitary condition. The inspections of stock shipments in the restricted area to points in or out as well as the regular superintending of the cleansing and disinfection of cars carrying stock shipments, have been numerous and exacting, occupying a great deal of time. In addition to the regular Inspectors, the services of three resident veterinarians have been made use of for this purpose, at Macleod, Claresholm and High River.

All stock cars reaching Calgary are held, cleansed and disinfected before being used again.

I have the honour to be,

Sir,

Your obedient servant.

J. C. HARGRAVE.

*Inspector.*

The Veterinary Director General,  
Ottawa.



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## APPENDIX No. 7.

S. F. TOLMIE, V.S.

VICTORIA, B.C., March 31, 1909.

SIR,—I have the honour to submit my report for the year ending March 31.

*Gateway.*—The imports at this port show a considerable falling off as compared with previous years. This is due largely to the opening of the port of Kingsgate. Settlers entering Canada from Washington and destined for prairie points usually come via Spokane and when travelling via Kingsgate are enabled to secure more satisfactory transportation facilities than when entering by way of Gateway, where a transfer from the Great Northern to the Canadian Pacific Railway is necessary shortly after entering Canada.

During the year 202 horses, 2 mules and 2 cattle were entered at this port. Two of the above horses were stolen animals smuggled into the country and were inspected by Dr. Bell at Fernie.

*Kingsgate.*—At this port 735 horses, 20 mules and 109 cattle and 505 sheep were inspected. During the year the stable at this station was painted and the fences were whitewashed and it is now in first-class condition.

*Nelson.*—11 horses, 176 cattle and 785 sheep were inspected at this port. The importance of Nelson as a live stock port of entry has also been reduced by the opening of Kingsgate.

It was found necessary to make some small repairs to the foundation of the quarantine stable and now the plant here is in good order.

*Rossland.*—45 horses, 181 cattle and 285 sheep were inspected at Rossland. The station at this point which is a rented one is not very satisfactory owing to its low situation, the entrance frequently becoming blocked by drifting snow during the winter months. More suitable premises will if possible be recommended to you before next winter.

Inspector Frank who has charge of Nelson and Rossland rejected 3 cattle on tuberculin test during the year. 3 horses were rejected on Mallein test, 8 other horses accompanying the re-actors were returned to the United States and were not again presented for entry. 9 horses were tested the second time before being permitted to enter, and two other horses which had been permitted to proceed to their destination under special license were tested. 13 swine were refused admission on account of not being accompanied by the necessary certificates.

53 stock cars were cleansed and disinfected under the supervision of Inspector Frank.

*Grand Forks.*—At Grand Forks 49 horses, 2 mules and 80 cattle were inspected.

*Midway.*—37 horses and 51 cattle were inspected at Midway. 19 stock cars were cleansed and disinfected under the supervision of Inspector Tamblyn during the year.

*Myncaster.*—26 horses, 19 cattle, 35 sheep and 25 swine were inspected during the year at this port. Of these 7 horses were rejected on Mallein test.



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A stable for testing purposes is rented at Myncaster. It is conveniently situated and is fairly suitable for the purpose.

*Bridgesville.*—43 horses, 178 cattle and 2,407 sheep were inspected at Bridgesville. Of these 4 horses were rejected on Mallein test.

A proper testing stable is required at this point and I am now negotiating with the Great Northern Railway with a view to securing a suitable site for the purpose.

*Chopaka.*—At Chopaka 46 horses and 9 cattle were inspected. Of these 2 horses were rejected on test.

This station is inconveniently situated being several miles from the nearest hotel and stable accommodation, consequently all inspections for this port have been conducted at Keremeos.

*Osoyoos.*—260 horses were inspected at Osoyoos. Of these 151 were entered for temporary stay and 109 were subjected to Mallein test. Of the latter 2 were rejected. 17 cattle were inspected. Of these 11 were tested and all passed the test. 1 mule and 200 sheep passed inspection also.

The new quarantine stables and yards are proving a great convenience at this port.

*New Westminster and sub-ports.*—2 burros, 674 horses, 143 cattle, 7,246 sheen. 5 swine, 12 mules, 1 camel and 18 goats were entered at New Westminster and sub-ports. The burros came from Mexico and besides being tested were subjected to a very careful examination for ticks. None were found, but as an extra precaution the animals were clipped. All the hair was burnt and a liberal dressing of mange mixture as prescribed by the department was applied all over them.

*Vancouver.*—234 horses, 4 mules, 2 cattle, and 16,586 sheep were inspected here. Rented stables are utilized at this port for testing purposes. They are fairly satisfactory. Since the Red Water investigation commenced Mr. W. Kininmonth has been placed in charge at this station and the experimental animals kept here.

*Victoria.*—At Victoria 196 horses, 76 mules, 6 cattle, 14,422 sheep, 6 deer and 2 swine were inspected. 1 horse was rejected on mallein test. The mules were nearly all consigned to the Coal Mines at Nanaimo, Ladysmith and Union.

#### HOG CHOLERA.

This disease was encountered on 19 premises; 164 swine died and 381 were slaughtered. Compensation was paid on them.

#### GLANDERS.

This disease was found on 11 premises; 19 horses were destroyed and compensation was paid for them.

#### MANGE.

Mange was reported once, the horses in question having contracted the disease en route to British Columbia. When examined the animals were found to have been treated and about cured. They were kept isolated until all further danger of the disease was passed.

#### SHEEP SCAB.

Three flocks of sheep numbering 1,187 altogether, 988 head of which belonged to one firm, were quarantined for scab. Owing to the lateness of the season little other than band dressings could be done but the outbreak will be vigorously dealt with as soon as the weather permits.



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## RED WATER.

This disease has been investigated during the year by Dr. Bowhill. You now have a full report of this work. Several animals were purchased for experimental purposes and an experiment station has been established at Vancouver. Some valuable information has been gathered regarding the disease. Red Water has caused serious loss in a few districts in British Columbia for some years past. Several reports of suspected contagious disease have been received and dealt with in various parts of the province. In many instances the reports were found to be groundless on investigation. One animal for export to the United States was tested and was given a certificate.

I have the honour to be,

Sir,

Your obedient servant,

S. F. TOLMIE,

*Inspector.*

The Veterinary Director General,  
Ottawa, Ont.



## APPENDIX No. 8.

C. H. HIGGINS, B.S., D.V.S., PATHOLOGIST.

OTTAWA, March 31, 1909.

SIR,—I have the honour to transmit this my report covering my duties as pathologist and officer in charge of the Biological Laboratory of the Department for the past year.

The year just ended has been of more than ordinary interest as my work has shown a great increase in all of its various lines and it is most gratifying to know that it has increased its importance to the Health of Animals Branch. A much larger number of specimens than formerly has been received for examination, totalling 376 series. While this number may appear small when compared with the examinations made by similar institutions, it is in reality large for each series usually means the minute examination of a number of separate specimens, or a series of animal inoculations involving a clinical record and pathological diagnosis in each instance.

Decisions necessitating detailed technical studies before formulating a definite opinion have been required from time to time and the information gained by these studies has been of benefit to the Branch. The diagnoses required by the Meat Inspection Division on controversial matters have proven very interesting features of the work of the laboratory and in some instances have presented problems requiring minute investigations.

The technicalities surrounding the preparation of the various biological products manufactured by me during the year have in some instances been difficult of solution, however, the greatest of these have been surmounted and an uninterrupted supply sufficient to meet the steadily increasing demands from your office has been maintained. Detailed information concerning the disbursements from the laboratory will be given in connection with my remarks on each product, but it may be of interest to note that 1,051 registered packages containing these products have been sent from the laboratory during the year.

The future needs of the laboratory are more pressing than ever in its history. The available space in the building has been subdivided to accommodate the various lines of work as isolated rooms were required for the separation of the virulent infections from our manufactured products, until at present there is no further space available for expansion within the walls of the present structure. As our work increases, more room will be required and I believe that it is now advisable to consider a scheme that will provide the necessary space and facilities for its more economical conduct. The present building, however, has enabled the working out of many details absolutely necessary prior to the development of a larger institution. Until recently the extent of our various operations has been on such a limited scale that gas has proven the most suitable means of carrying on the details, but at the present time I believe that we have reached a point where it is advisable to consider economy in methods commensurate with the scale on which the present routine of the laboratory is conducted. While gas is absolutely essential for the carrying out of many of the minor details in any laboratory, it does not provide us with an economical means of heating our large incubating rooms nor for the various processes required in the cooking and sterilization of large quantities of nutrient culture media.

Not only are the laboratory facilities becoming inadequate to the increasing demands occasioned by the increase in the work of the whole branch, but there is also



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an urgent need for additional assistance that investigations other than those necessitated by the routine may be taken in hand. Close observation reveals that similar institutions provide an opportunity to pursue original studies, while at this laboratory such studies have assumed a secondary place as the time of myself and my assistant is fully occupied in the manufacture of biological products, the examination of material received for diagnosis and in the various clerical duties connected therewith.

It has been repeatedly demonstrated at this laboratory that practical results are only possible where the details of an investigation may be continued over an extended period without interruption. Investigations have been taken in hand at various times only to be set aside on account of the routine demanding my undivided attention in the solution of the many problems that have been presented, and the loss in ultimate results has been considerable. Not only has there been a loss in results, but the expense necessitated at the inception of such studies, in chemicals, gas and the time required for the fitting up of special apparatus, has not been compensated for as the investigations are still incomplete.

There are many lines of work open for investigation that cannot fail to add to our knowledge of diseased conditions, which should be seriously considered. Rabies should receive consideration other than that necessary for the establishing of the diagnosis in each instance. The subject of tuberculosis is before the scientists and laity of the world and we should aid in the practical solution of some of the technical problems presented. Tuberculosis in fowls is gaining increased foothold in Canada and a more detailed knowledge of the modes of infection may aid in a solution of this serious question.

Many problems are presented by the Meat Inspection Division, the more detailed consideration of which cannot fail to be of value to all the interests concerned therewith. Indeed, so many fruitful lines of research are open that their further detailed enumeration will serve no useful purpose, it being sufficient to state that while this laboratory is at present indispensable, its value to the Branch can be increased many fold by a more minute study of animal diseases and their relationship to the livestock interests than has heretofore been possible.

That a more intimate knowledge of laboratory methods may be gained by officers of the Branch, it may prove advantageous to systematically detail various inspectors for work at the laboratory. It is probable that much good would result as inspectors with a detailed knowledge of laboratory requirements could make a better selection of material for diagnostic purposes and with the increased knowledge that can only be obtained at a laboratory they would make better inspectors for many special field investigations. Aside from these advantages we would be in a position to select those showing marked proficiency in this specialized work for temporary or permanent service at the laboratory.

In September last, acting on your instructions, I attended the annual meeting of the American Veterinary Medical Association held in Philadelphia; later, with your approval, I was privileged to attend the International Congress on Tuberculosis at Washington, where I met scientists of repute from various countries engaged in technical studies similar to those confronting me at this laboratory. The interchange of ideas then possible, together with the acquaintances made, have already proven of mutual benefit. Not only was it possible for me to meet laboratory workers while absent from Ottawa, but an opportunity was also provided to familiarize myself with the facilities supplied investigators in other laboratories and also to observe their methods, not only in the management of their laboratories but in the carrying out of the details of the work.

During the International Congress I served by special request as one of the Committee on Awards to judge the pathological exhibits which were of a very high order.

Shortly after my return from Washington, accompanied by Inspector Perdue, I visited Ames, Iowa, reaching there on October 12, to witness a demonstration by the



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United States Bureau of Animal Industry on their method of immunizing hogs against hog cholera. Besides Dr. Perdue and myself there were present: Dr. A. D. Melvin, Chief of the Bureau; Dr. M. Dorset, Chief of the Bio-Chemie Division of the Bureau; Dr. Niles, in charge of the Ames Experimental Station and his staff; Dr. Austin Peters, chief of the Massachusetts Cattle Bureau; Dr. M. E. Knowles, State Veterinarian of Montana; Dr. L. M. Prine, Veterinarian to the State Experiment Station of Wyoming, and Dr. Wright, State Veterinarian of Illinois.

This Experimental Station at Ames was established by the Bureau of Animal Industry for experimenting with hog cholera and has recently been used to demonstrate the facilities required in the preparation of a serum for its prevention and treatment in the field. I was very grateful for the privilege of attending the demonstration and also for the many courtesies extended to Dr. Perdue and myself by the Chief of the Bureau and his officers during our short stay at Ames.

The finding of deSchweinitz and Dorset that hog cholera is the result of an infection with an ultra-microscopic filtrable virus and not to the bacillus studied on this continent by Salmon, Smith and Moore has been substantiated by Dorset, Bolton and McBride in America, the laboratory of the Board of Agriculture in England, Huttyra, Uhlenhuth, Xylander, Ilubener, Bohtz, Carre, Leclainche and Vallée in Europe and by Theiler in South Africa.

Working on the basis of the ultra-microscopic, filtrable causative agent, the fact that it is possible to secure an increased resistance to the naturally or artificially produced disease does much to substantiate the correctness of this view. These findings are also in accord with my experiments of 1902 that the diagnosis of the disease by agglutination methods is unreliable.

The experiments at Ames under Dr. Dorset's direction are but evidences of the practical results possible from unrestricted scientific investigations, although it appears to me that further studies are necessary before this method of immunization can with economy be applied for the protection of susceptible animals in a locality where the disease is frequently observed.

The recent report of King, bacteriologist to the Kansas State Agricultural College Experiment Station is worthy of careful study, containing as it does many points of more than passing interest. In this experimental work King has used the horse for the attenuation of the virus required for purposes of immunization. He has found that serum, withdrawn from a horse injected with virulent virus twenty-four hours previously possesses preventive properties when injected subcutaneously into hogs and that horse serum withdrawn four hours after the injection of virulent virus also acts as a preventive when injected subcutaneously in small quantities. The twenty-four hour horse serum, however, is not constant in its protective properties. He also finds that the immunity thus acquired extends over a period of from three to eight months. A report upon the practical results from the application of this method is promised for an early date.

From a study of the investigations in the immunization of hogs against hog cholera, it does not appear to me that it would at present be wise to institute a change from the methods now practised for its control in Canada. I am, however, of the opinion that while there are many points connected with the experimental data at hand requiring elucidation, the ultimate results will be successful from the practical as well as the technical standpoint.

In November, during the outbreak of foot-and-mouth disease in the United States, it was possible for me to render assistance by visiting various boundary points and aid the organization of the inspection work, at the same time pointing out the duties of the inspectors in charge that their instructions to subordinate officers would be more uniformly enforced. To this end I visited various points in provinces of Quebec and Ontario.

At Detroit, on December 2nd last, en route from Sarnia to Windsor, I was able



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to confer with Dr. Mohler, Chief of the Pathological Division of the Bureau of Animal Industry and Dr. M. J. Rosenau, Director of the Hygienic Laboratory of the Public Health and Marine Hospital Service at Washington. At this interview I learned of what appeared to be the probable source of origin of the outbreak and this information later proved valuable when tracing certain Canadian cattle shipped to Buffalo, that, earlier in the investigations of the United States authorities were suspected of being responsible for the outbreaks at Watsonstown and Danville, Pennsylvania. Subsequent events fortunately removed the suspicion attached to these cattle of Canadian origin and we are now aware that it was founded on circumstantial evidence alone.

BIOLOGICAL PRODUCTS.

Mallein.

During the year the disbursements have shown a marked advance over that of any previous period in the history of the laboratory, 32,815 doses having been sent out on instructions received from your office. Facilities considered adequate for the preparation of this product two years ago have long since been taxed to their utmost capacity for it was not then considered that necessity would require the doubling of our output within at least eight years but the rapid growth of the Western Provinces and the continuation of your policy of testing all horses brought into the country have been the means of so increasing the demand for this product that it has already reached a figure more than twice that of two years ago.

The appended statement gives our disbursements for three years and also the distribution by provinces for the past year.

	1906-7.	1907-8.	1908-9.
April.. . . . .	1,370	1,750	3,861
May.. . . . .	702	1,600	3,140
June.... . . . .	1,400	1,308	2,720
July.. . . . .	1,645	2,205	3,000
August.. . . . .	1,730	1,675	2,347
September.. . . . .	1,786	1,150	2,200
October.. . . . .	1,245	1,835	1,935
November.. . . . .	598	1,895	2,567
December.. . . . .	225	553	1,420
January.. . . . .	712	2,090	905
February.. . . . .	830	1,320	1,260
March.. . . . .	2,060	3,565	7,460
Total.. . . . .	14,303	20,946	32,815
Maritime.. . . . .			225
Quebec.. . . . .			893
Ontario.. . . . .			1,757
Manitoba.. . . . .			7,800
Saskatchewan.. . . . .			12,000*
Alberta.. . . . .			7,800
British Columbia.. . . . .			2,030
Yukon.. . . . .			80

32,815

\* For the month of April this includes the amount sent to Dr. Hilton for use in Saskatchewan and Alberta (1,500 doses). The two provinces have been administered separately since May 1, 1908.

Tuberculin.

The disbursements of tuberculin have been made as requested by your office from that prepared at the laboratory and show an increase over those of any preceding



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year. Little difficulty is experienced in its manufacture and aside from the *old tuberculin* prepared for disbursement from an organism of bovine origin, I have also prepared a bovine bacilli emulsion. This bacilli emulsion has been used on cases of localized tuberculosis in the human being by medical practitioners who report satisfactory therapeutic results. Special precipitated tuberculin for opthalmic tests has also been prepared in sufficient quantity for experimental purposes. Little trouble would be experienced in the preparation of any of the special tuberculins used in veterinary and human medicine with but very little additional equipment.

A detailed monthly statement of the disbursements for the past three years is as follows:—

	1906-7.	1907-8.	1908-9.
April.. . . . .	267	509	578
May.. . . . .	349	848	829
June.. . . . .	160	206	922
July.. . . . .	184	257	1,190
August.. . . . .	161	336	323
September.. . . . .	254	583	214
October.. . . . .	118	276	458
November.. . . . .	423	565	826
December.. . . . .	336	735	507
January.. . . . .	589	562	322
February.. . . . .	437	575	257
March.. . . . .	152	482	1,035
Total.. . . . .	3,430	5,931	8,061

*Black-leg Vaccine.*

During the year there have been forwarded from the laboratory as directed by your office, 8,064 doses of black-leg vaccine. This is a slight increase over the amount disbursed during the preceding year and the use of this product is likely to become more general when it becomes known that it is manufactured at this laboratory and disbursed on order from your office at such a nominal figure.

A detailed statement for the year just ended and that of 1907-8 is as follows:—

	1907-8.	1908-9.
April.. . . . .	250	2,185
May.. . . . .	392	1,177
June.. . . . .	554	601
July.. . . . .	392	572
August.. . . . .	254	550
September.. . . . .	586	734
October.. . . . .	998	206
November.. . . . .	785	218
December.. . . . .	1,560	410
January.. . . . .	...	35
February.. . . . .	270	420
March.. . . . .	990	962
	7,031	8,064

That the results following the use of this vaccine are satisfactory needs no further proof than the fact that the vaccine disbursed during the year just ended has been forwarded in many instances to those who had used it during the previous year, none of whom have complained that the vaccine is inert. Some complaints have been



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received covering certain minor features connected with the disbursements and in each instance steps were immediately taken to remedy the defect complained of.

Very little difficulty is experienced in its preparation and with each lot prepared I am able to overcome technicalities that at first seemed unsurmountable.

*Anthrax Vaccines.*

There have been disbursed from the laboratory during the year just ended, as requested by your office, 464 doses of each of the first and second anthrax vaccines. It is gratifying to learn that this amount is less than the amount disbursed at any time since the laboratory has been charged with supervising the individual shipments and more recently with the manufacture and distribution of the product. A detailed statement of the disbursements of the anthrax vaccines prepared at this laboratory during the past two years is as follows:—

	1907-8.	1908-9.
April.. . . . .	239	
May.. . . . .	17	
June.. . . . .	....	
July.. . . . .	98	265
August.. . . . .	77	75
September.. . . . .	5	10
October.. . . . .	15	43
November.. . . . .	....	
December.. . . . .	32	25
January.. . . . .	....	10
February . . . . .	....	
March.. . . . .	....	36
Total.. . . . .	483	464

The drying of this vaccine on threads and its disbursement on a metal clip attached to a cork of a sterile vial has proven a very satisfactory and convenient means for its distribution. So satisfactory has this method proven that its continuance is fully justified. In no instance have we learned of untoward effects following its use and our laboratory experiments still indicate its efficiency in protecting against a virulent infection subsequently administered.

## PATHOLOGY.

The features of the work of the laboratory that may be considered of a strictly pathological nature are very varied and deal with the examination of many tissues and body fluids in the determination of the cause of death or the alteration of the tissue in specific instances. Much of this work is of such a character that it would add little interest to this report although we have dealt with some interesting tumour formations forwarded by inspectors for diagnostic and museum purposes. Some of these are of more than ordinary interest and I will, therefore, present a detailed description of a few together with their origin and frequency of occurrence. Specimens of cysticerci (measles) are received from time to time and I am selecting the best of these for permanent museum preparations. Photographs showing the invasion of various tissues are presented herewith and beneath each is a full description concerning the origin and the nature of the lesion.

*An Endothelial Tumour.*

1025. Forwarded by Inspector Kellam from Montreal.

*History.*—Copy of Inspector Kellam's report concerning the lesions caused by the tumour formation.



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SIR,—I have the honour to inform you that I am forwarding a few lesions for examination. The specimens sent are typical in appearance but not in size, and were taken from the peritoneum in the region of the upper flank, rumen, omentum and diaphragm. The animal was an aged cow in fair condition, pregnant about the sixth month, abdomen pendulous. Post-mortem.—All organs in a healthy condition except the liver, spleen and peritoneum. The parietal portion of the peritoneum was literally covered with growths varying in size from a pea to half a bushel. Two of the growths were considerably larger than a half bushel. The smaller lesions were sessile, of a uniform white colour and firm consistency. Those from the size of a pea to a pigeon's egg and up were cystic, pedunculated, having a strong fibrous capsule, within which was a gelatinous substance white or pale yellow and in the centre was a quantity of pale yellow fluid.

The peritoneum covering the uterus, spleen, liver and intestines was seriously involved.

The growths were not found on any membrane except the peritoneum, and there were enough of the growths to nearly fill a two-bushel basket.

Kindly inform me of the nature of the lesion.

I have the honour to be, etc.,

(Sgd.) M. J. KELLAM.

*Diagnosis.*—Multiple endotheliomata. For details of the microscopical structure of this tumour refer to Plate I, Fig. 1.

*Remarks.*—It is unfortunate that the larger portions of this interesting tumour formation were not furnished for permanent preservation or that a photograph is not available for purposes of reproduction. The literature gives us but few references to the occurrence of endotheliomata in animals. In Kitt's pathology but a single reference is given to the occurrence of a similar tumour in a cow, as follows,—'Kunne-mann reports a psammoma of the cranial dura mater about the size of a duck's egg, overlying the anterior part of the brain of a cow.' The writer has examined a number of endotheliomata from the thoracic and abdominal cavities of fowls.

Endotheliomata are very closely related to the cancers although they rarely form metastases. They originate from the mesoblastic cells while cancer formations come from the cells of the ectoderm or entoderm.

This specimen is interesting, not only from its comparative rarity in the lower animals but also from the fact that such large masses were formed during its growth within the abdominal cavity.

#### *Carcinoma.*

1145.—Source.—The tumour in question (see Plate IV, Fig. 2) was accompanied by the following letter of transmissal:—

WINNIPEG, March 21, 1908.

SIR,—I am forwarding by express to-day to the Biological Laboratory, a specimen received from Inspector Ross at Establishment No. 20, being a tumour found in the rumen of a cow.

I have the honour to be, etc.,

(Sgd.) C. D. MCGILVRAY.

We have nothing in our records indicating that other lesions were present in this animal.

*Diagnosis.*—An examination of the tumour formation reveals the structure of a gelatinous carcinoma sometimes incorrectly termed 'colloid cancer' (see Plate I, Fig. 2.)



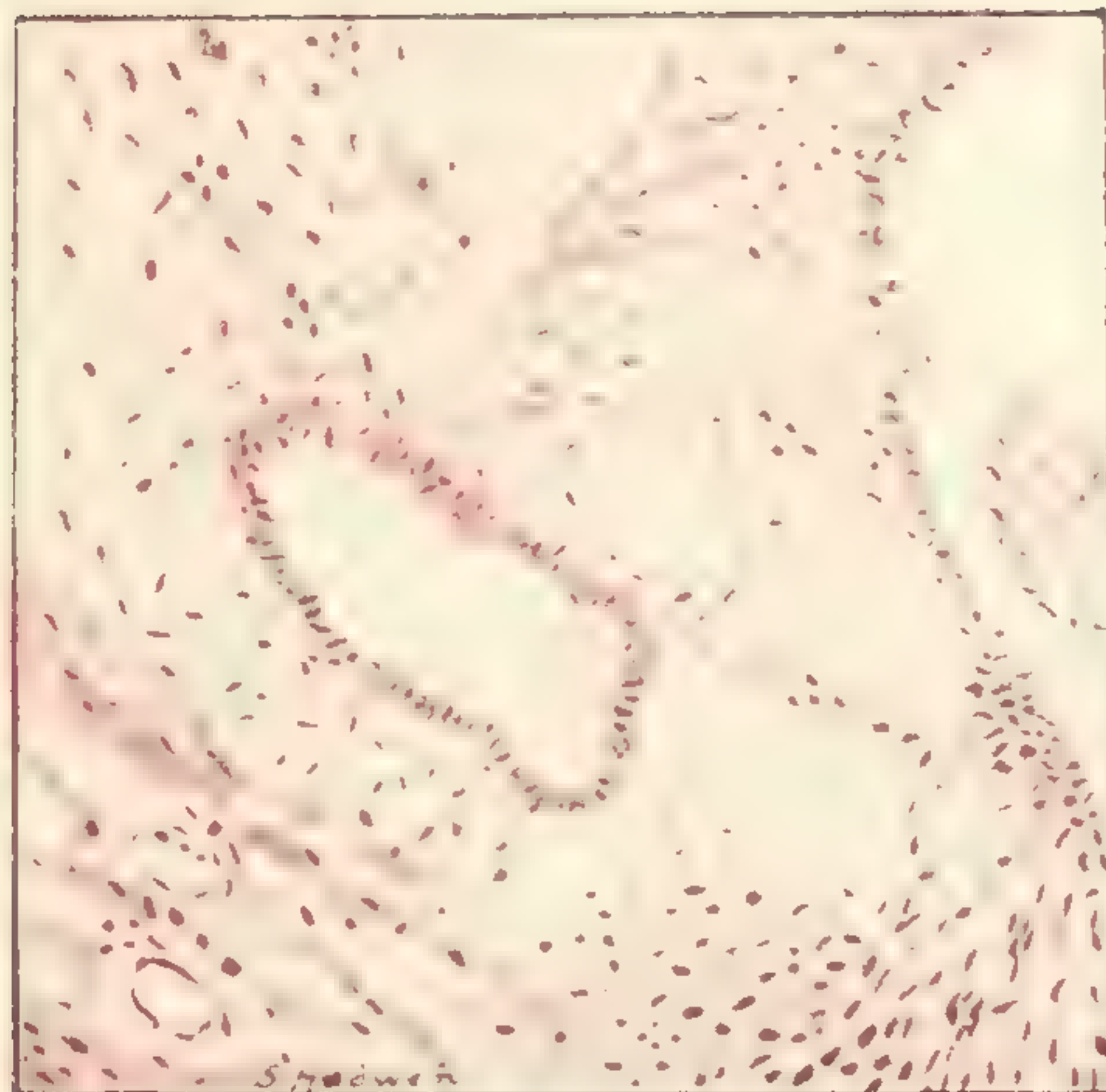


Fig. 1

**1025 ENDOTHELIOMA. (Multiple**

Presented by Inspector Kellam. Size, from that of pea to one foot in diameter.

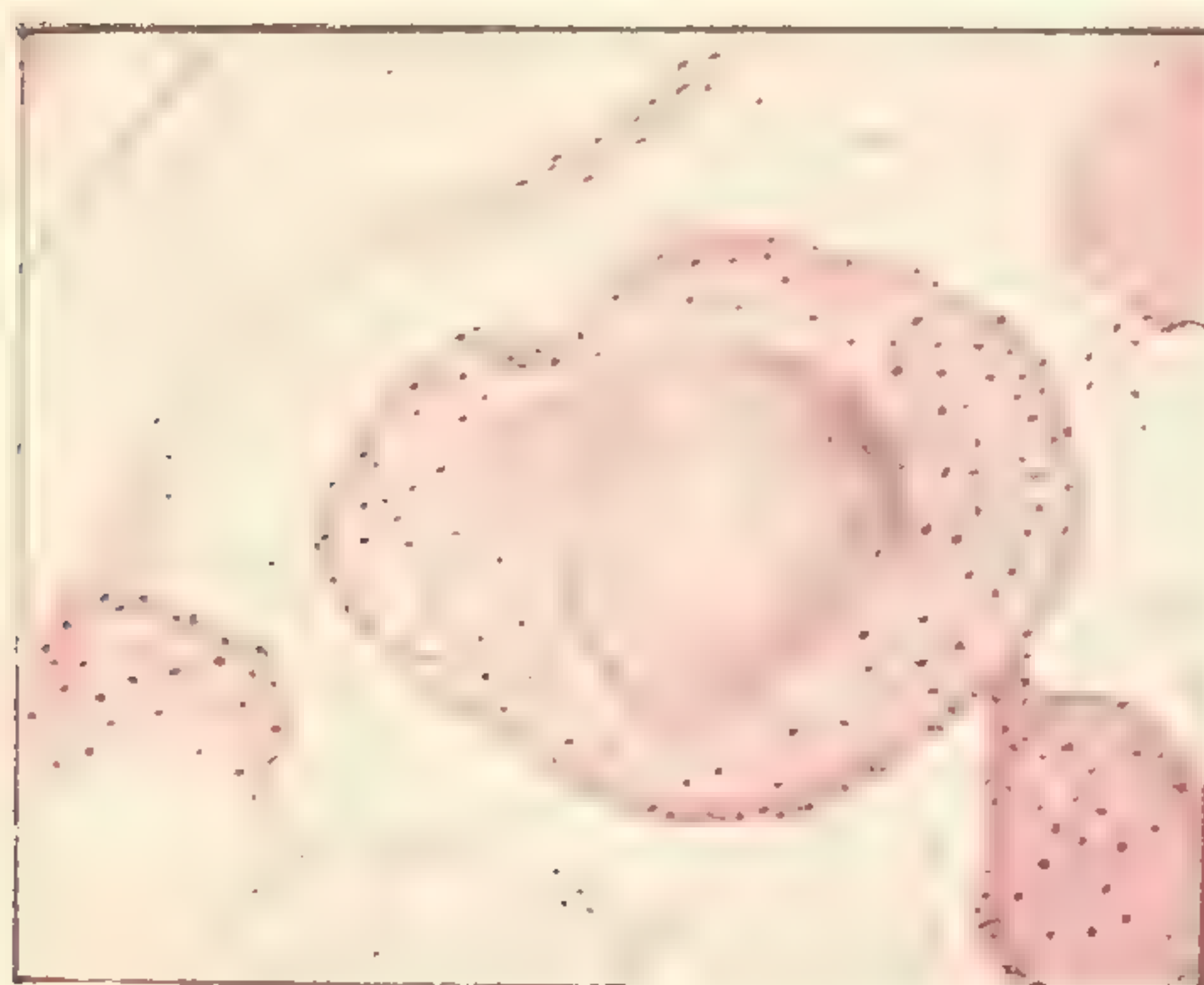
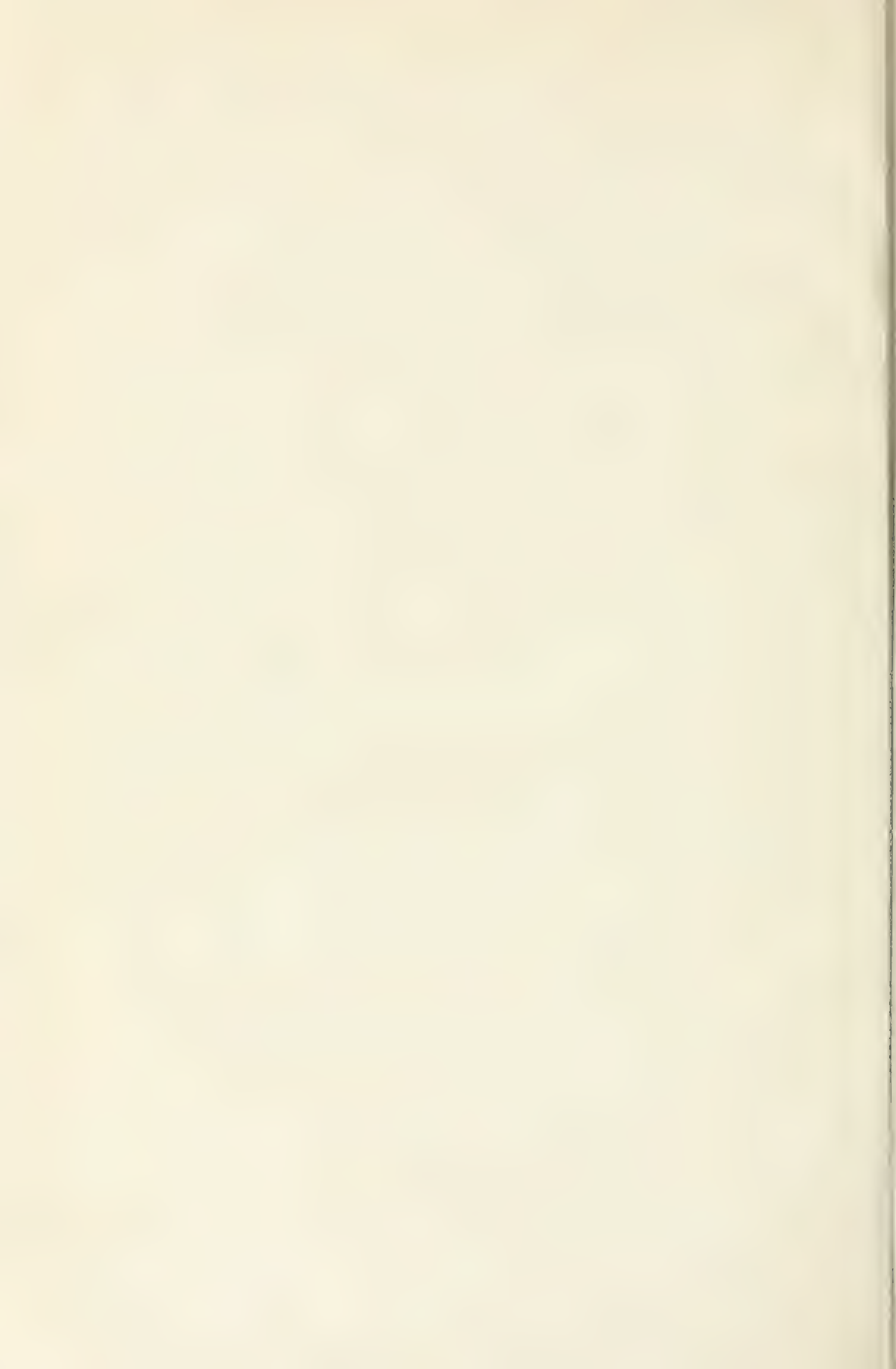


Fig. 2

**1145 -GELATINOUS CARCINOMA**

Presented by Inspector Ross. Weight, 1,800 grammes.







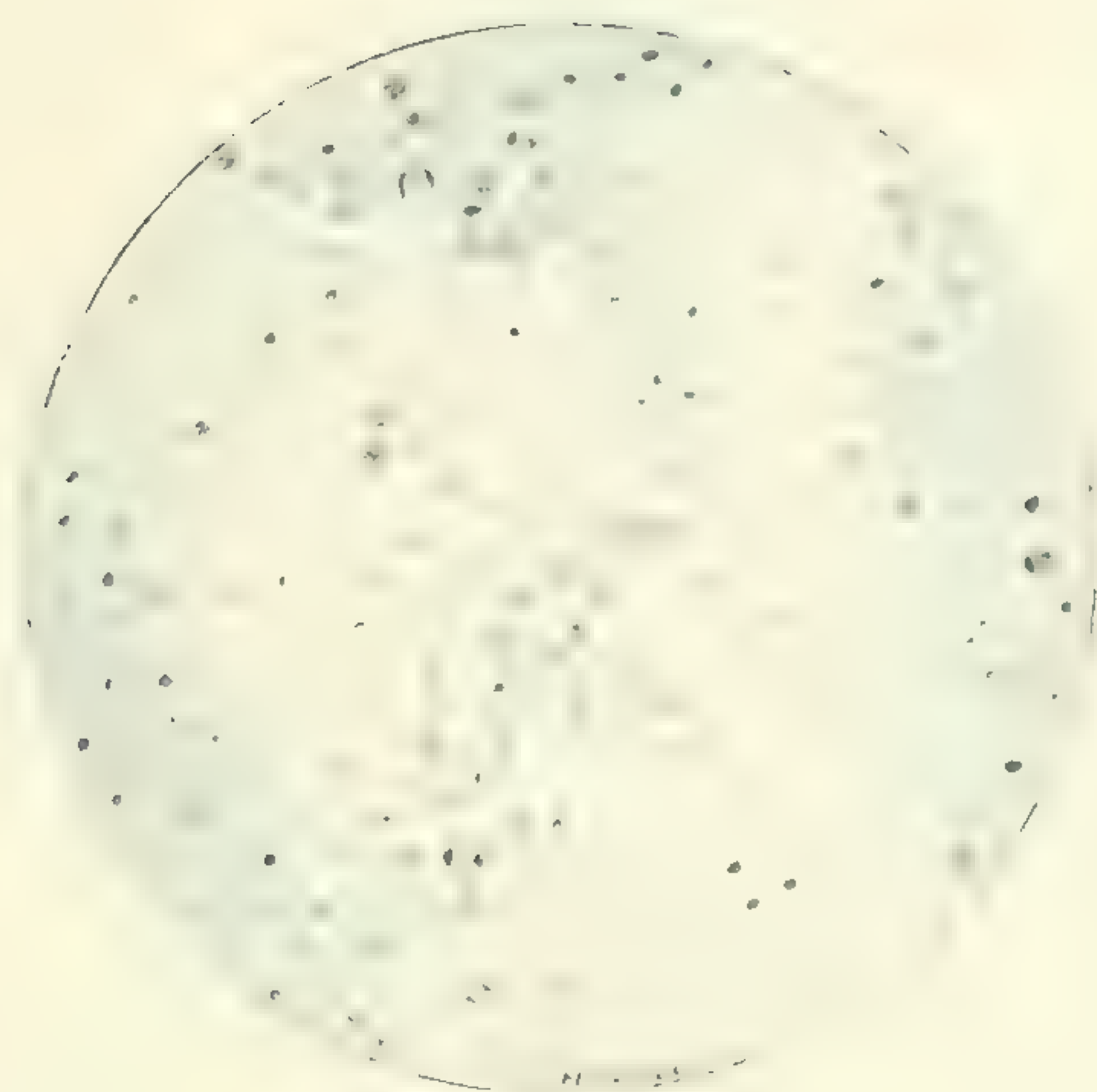


Fig. 1

**1063—SARCOMA**

Presented by Inspector Pine.

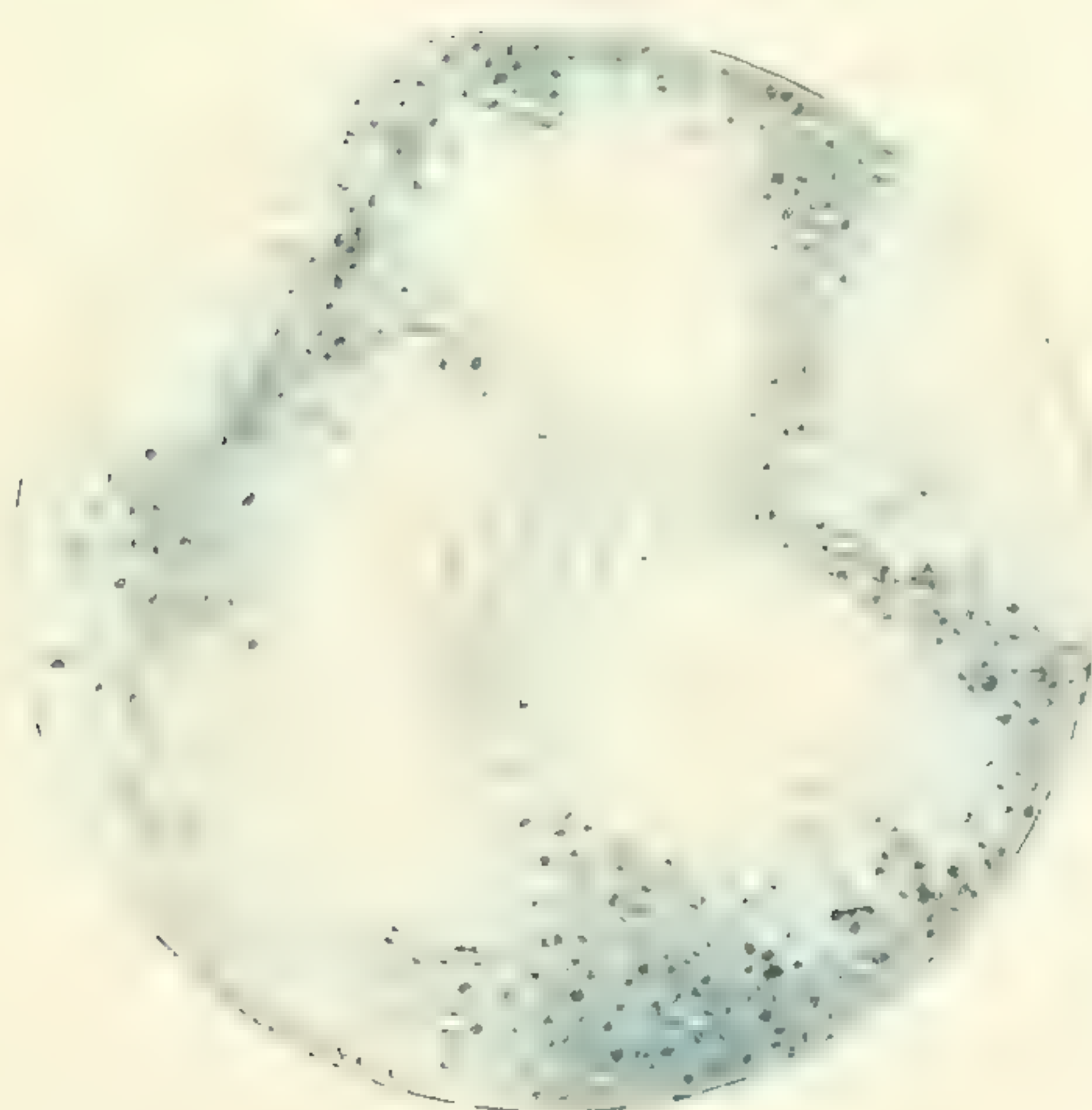
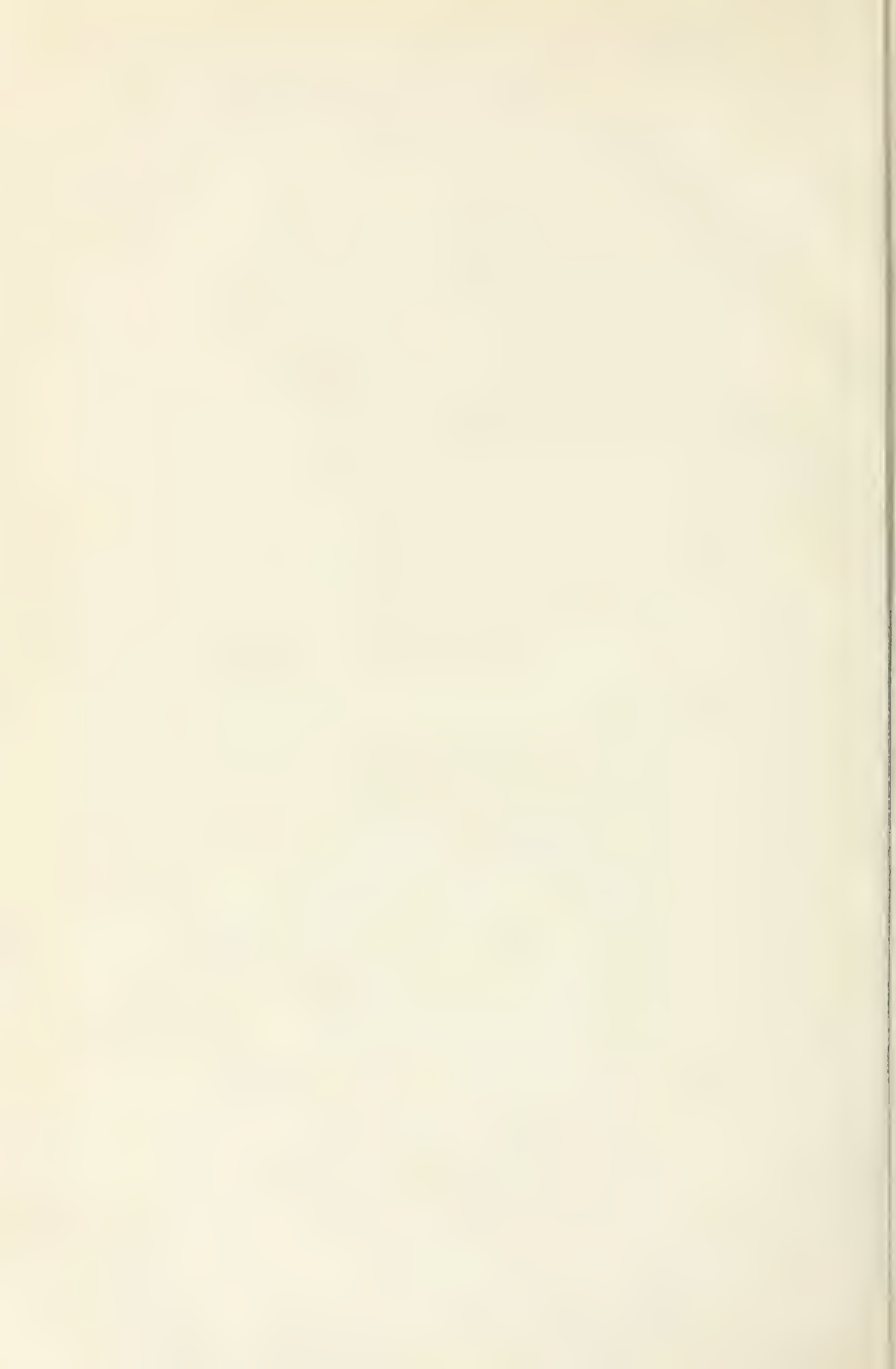


Fig 2

**880—ROUND CELLED SARCOMA**

In a fish (Pike). Presented by Inspector Fisher.







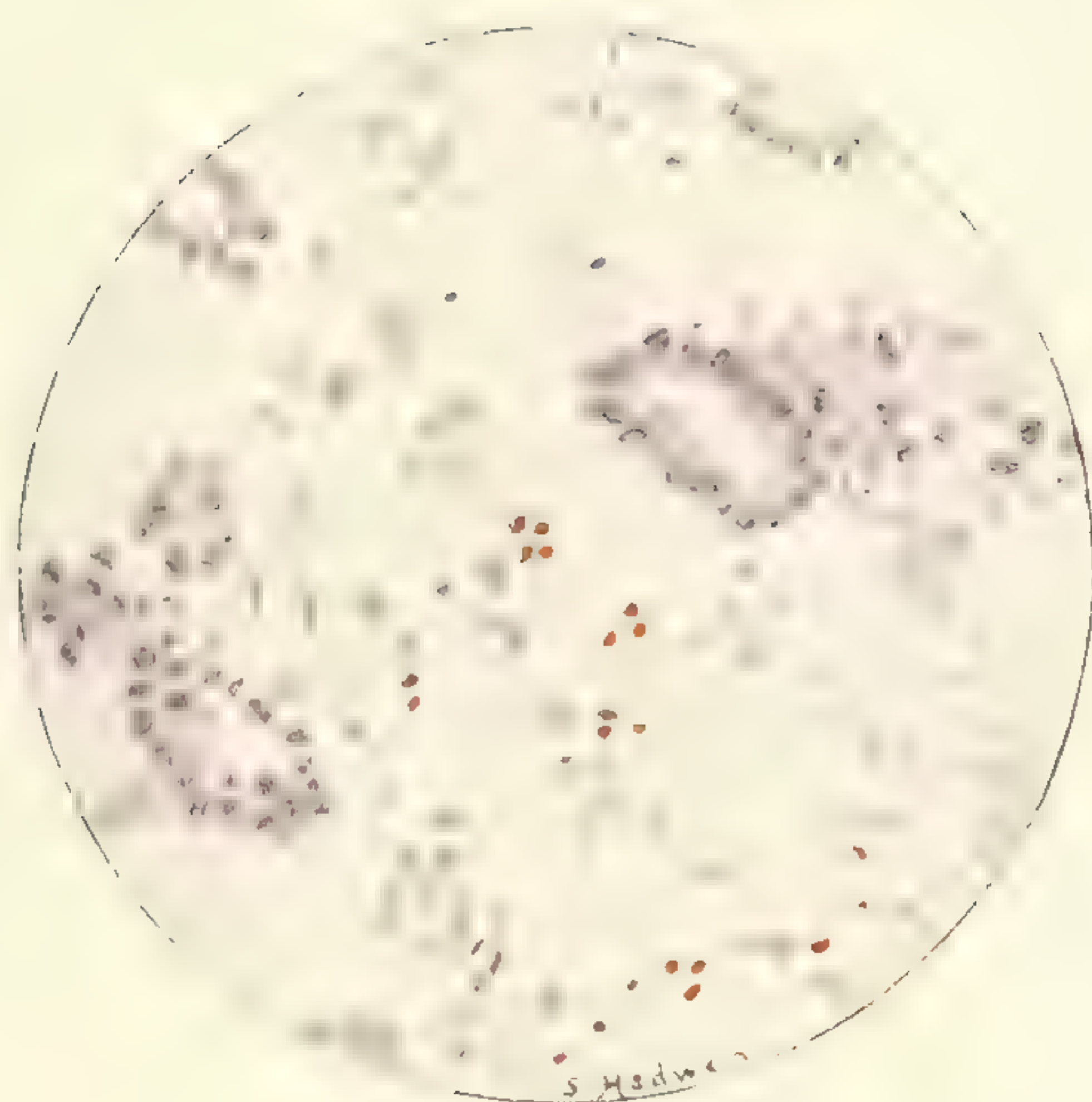


Fig. 1

**1066—ADENO-SARCOMA**

Weight, 6 ounces. Presented by Inspector Walsh.

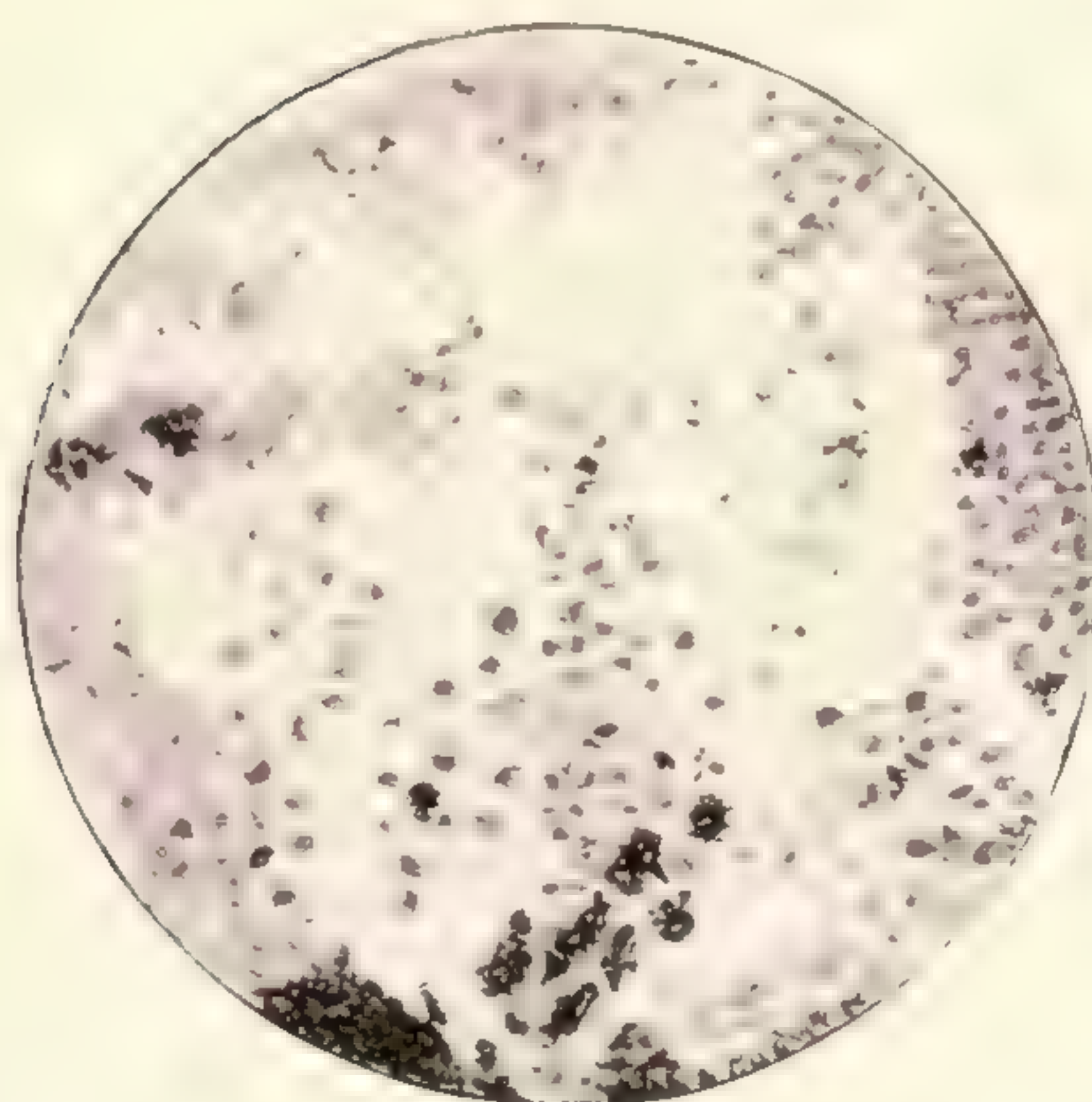
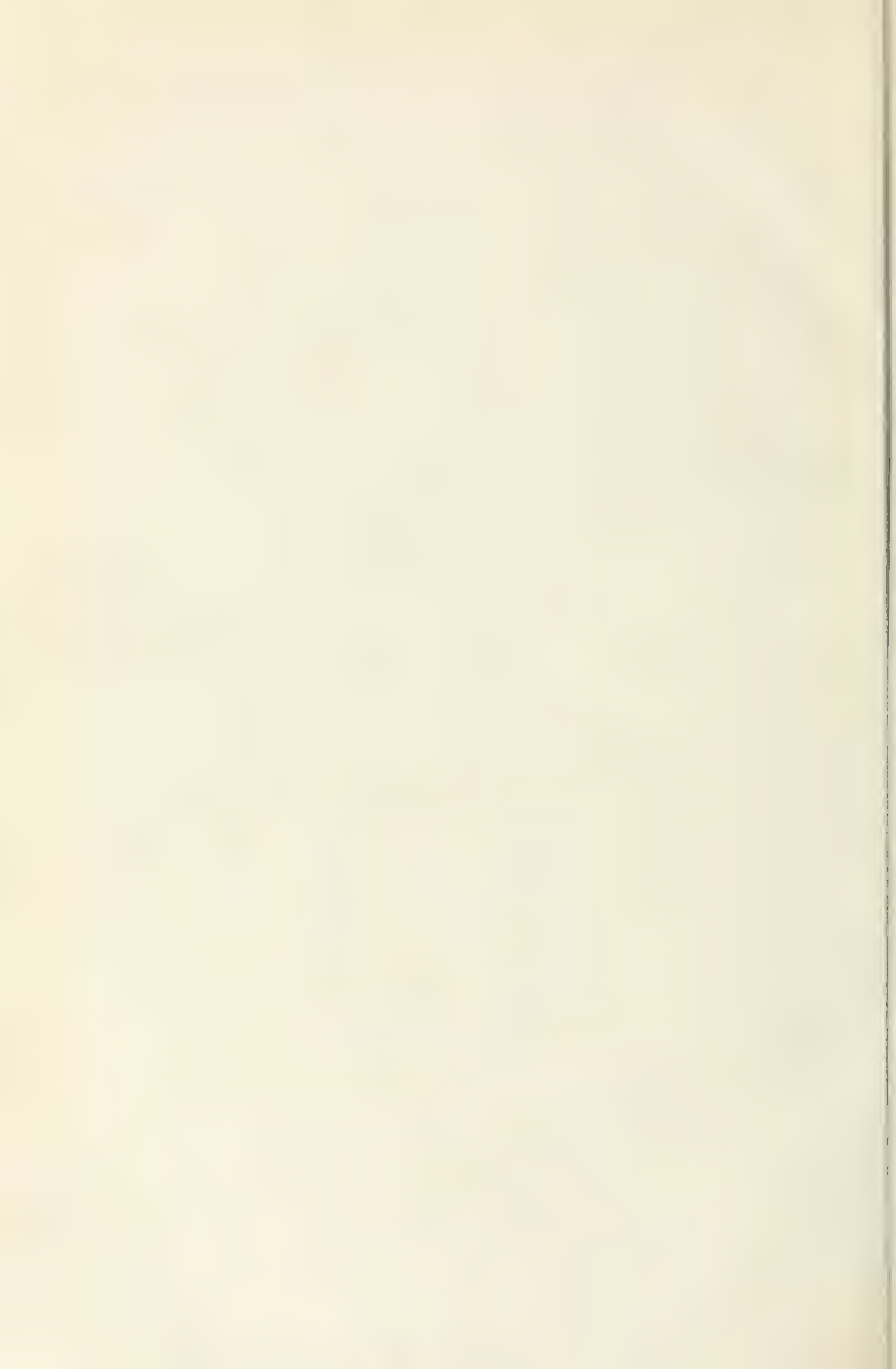


Fig. 2

**997—MELANOSIS**

Pigment in lymph gland of a red steer. Presented by Inspector Bruce.







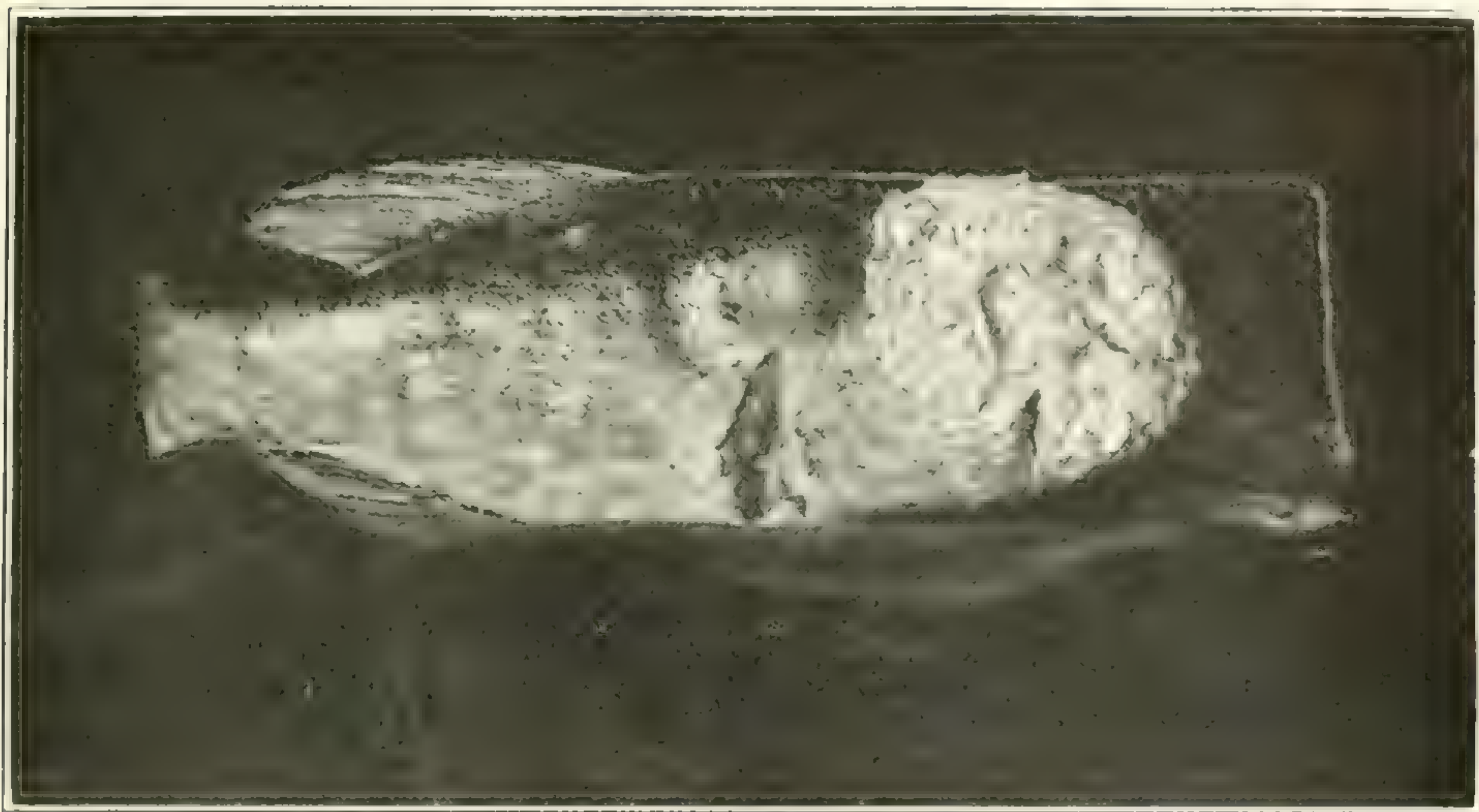


Fig. 1

880—SARCOMA IN A PIKE

See also Plate II, Fig. 2

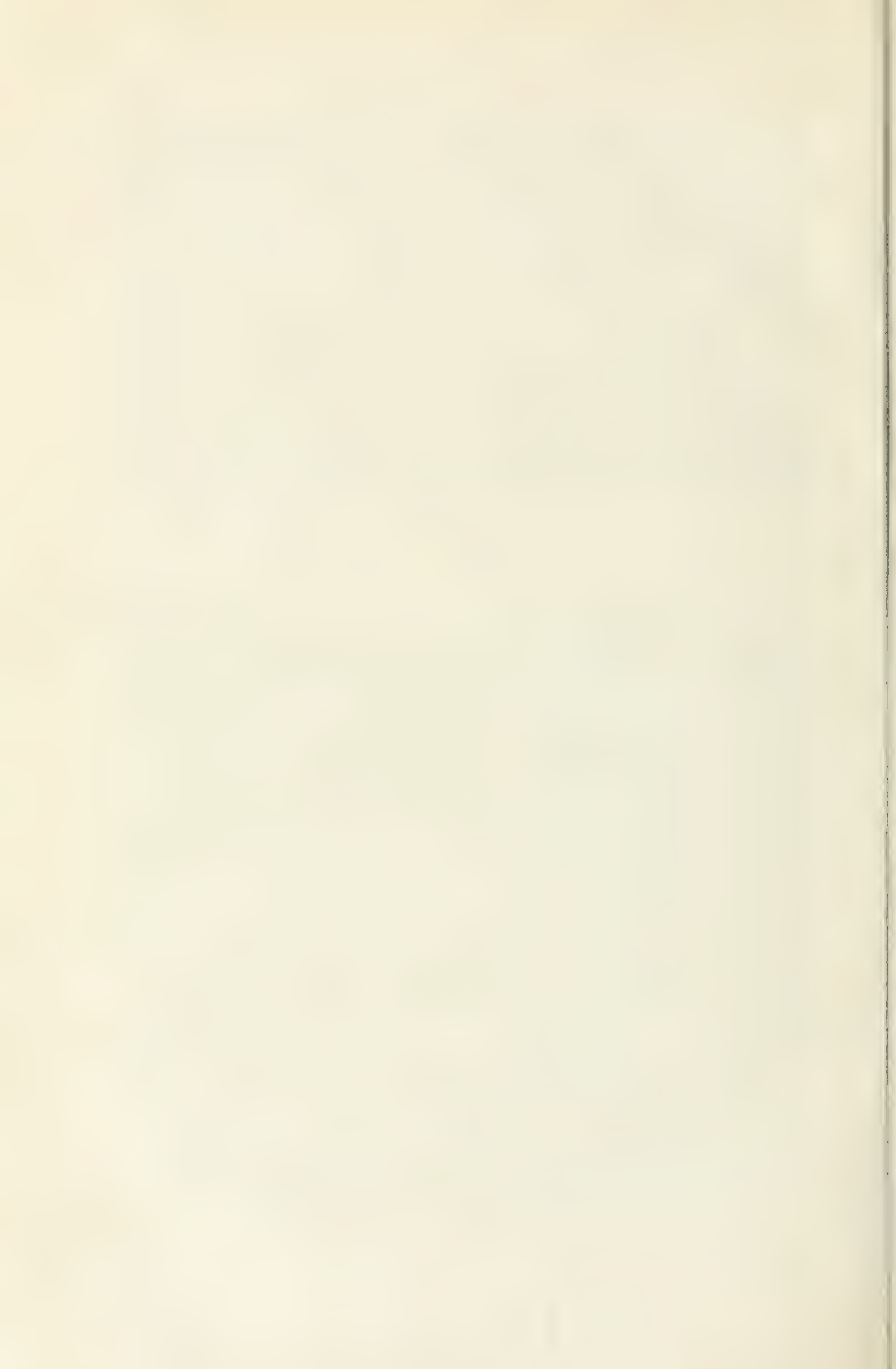


Fig. 2

1145 -CARCINOMA FROM THE RUMEN OF A COW

Weight, 1,800 grammes. See also Plate I, Fig. 2





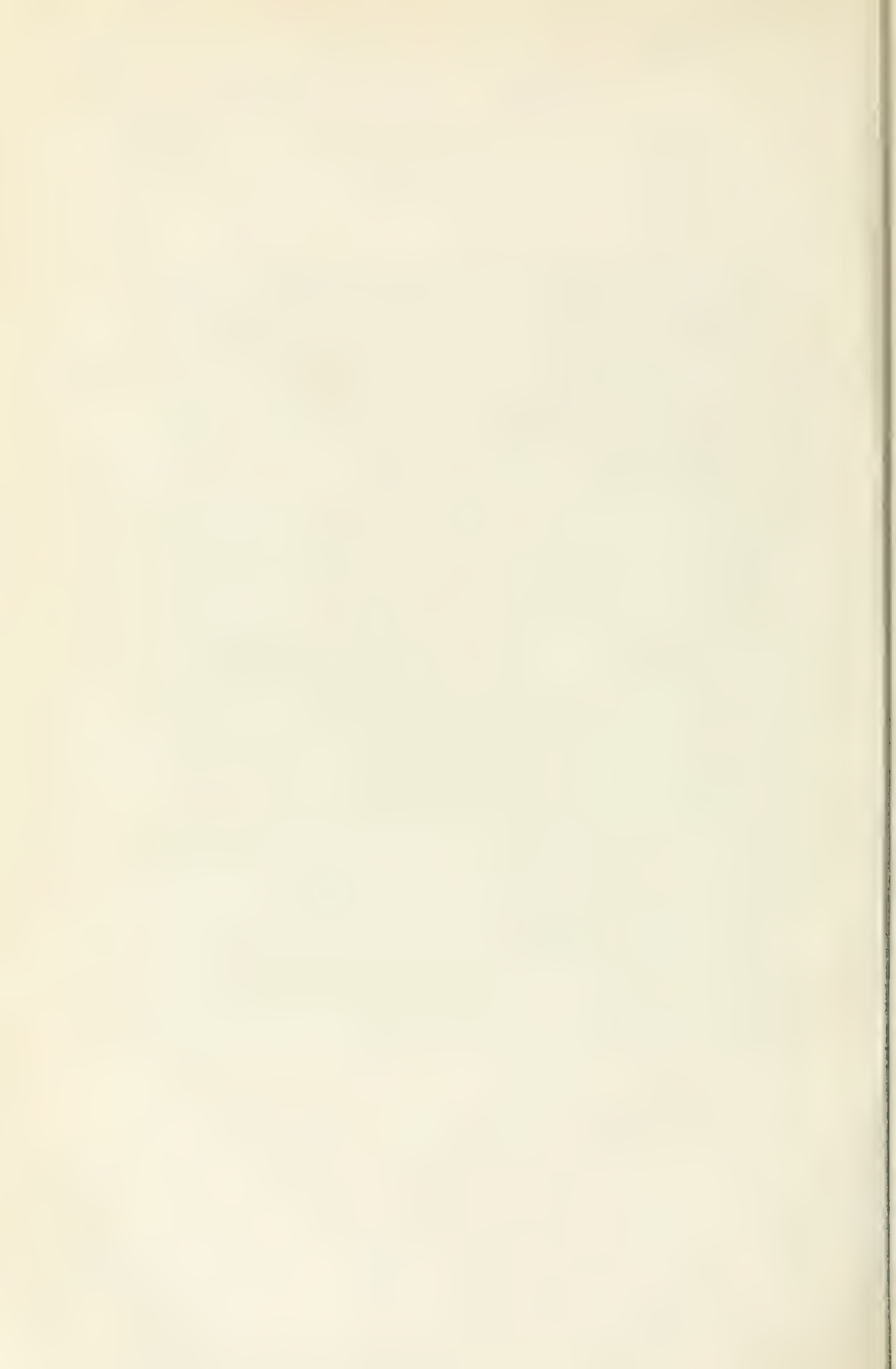




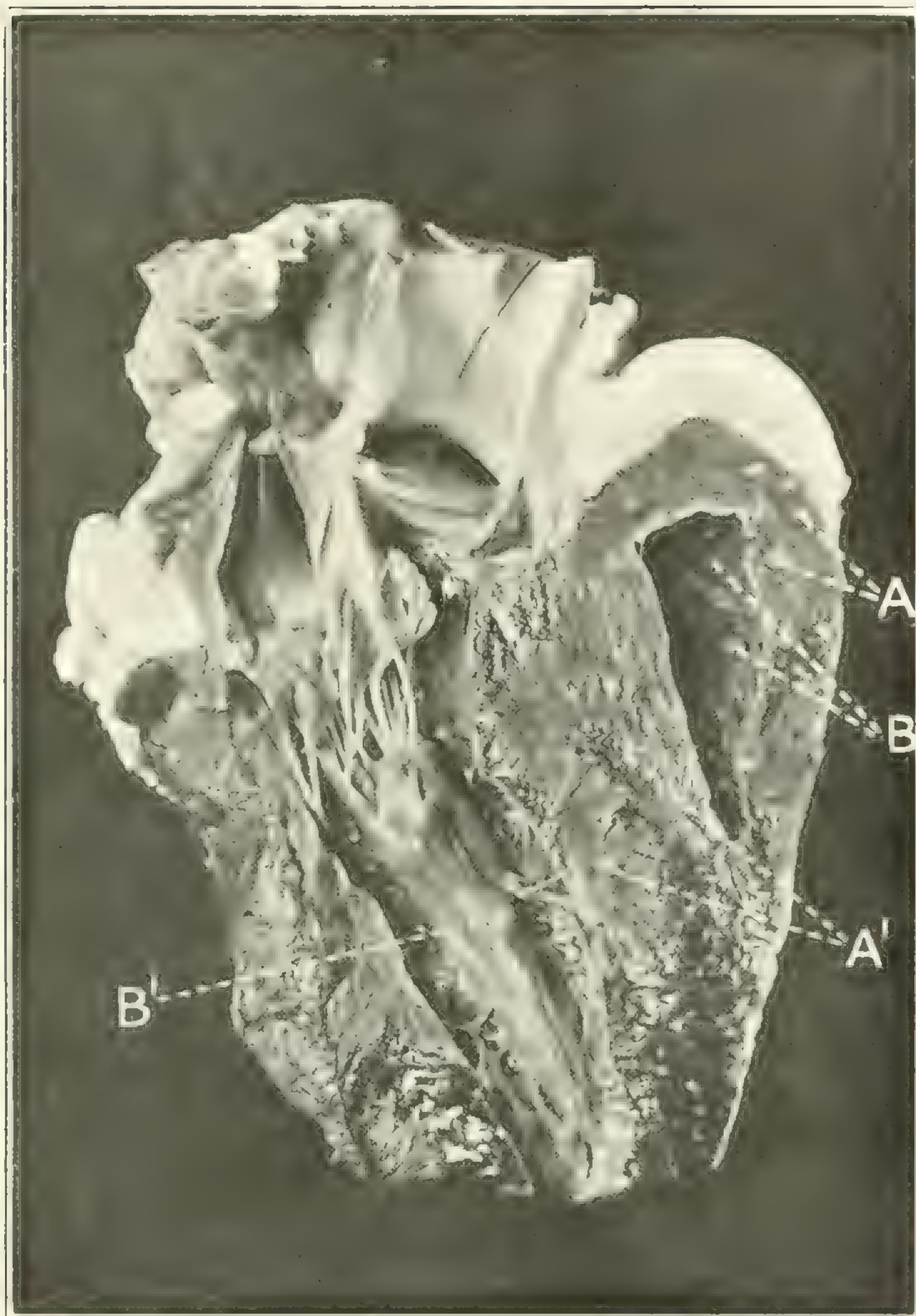
1010—MEASLES OF THE OX

Cysticerci embedded in the tissues of the heart. A, shows cysts just beneath the epicardium. Specimen forwarded by Inspector Fisher for the laboratory museum.





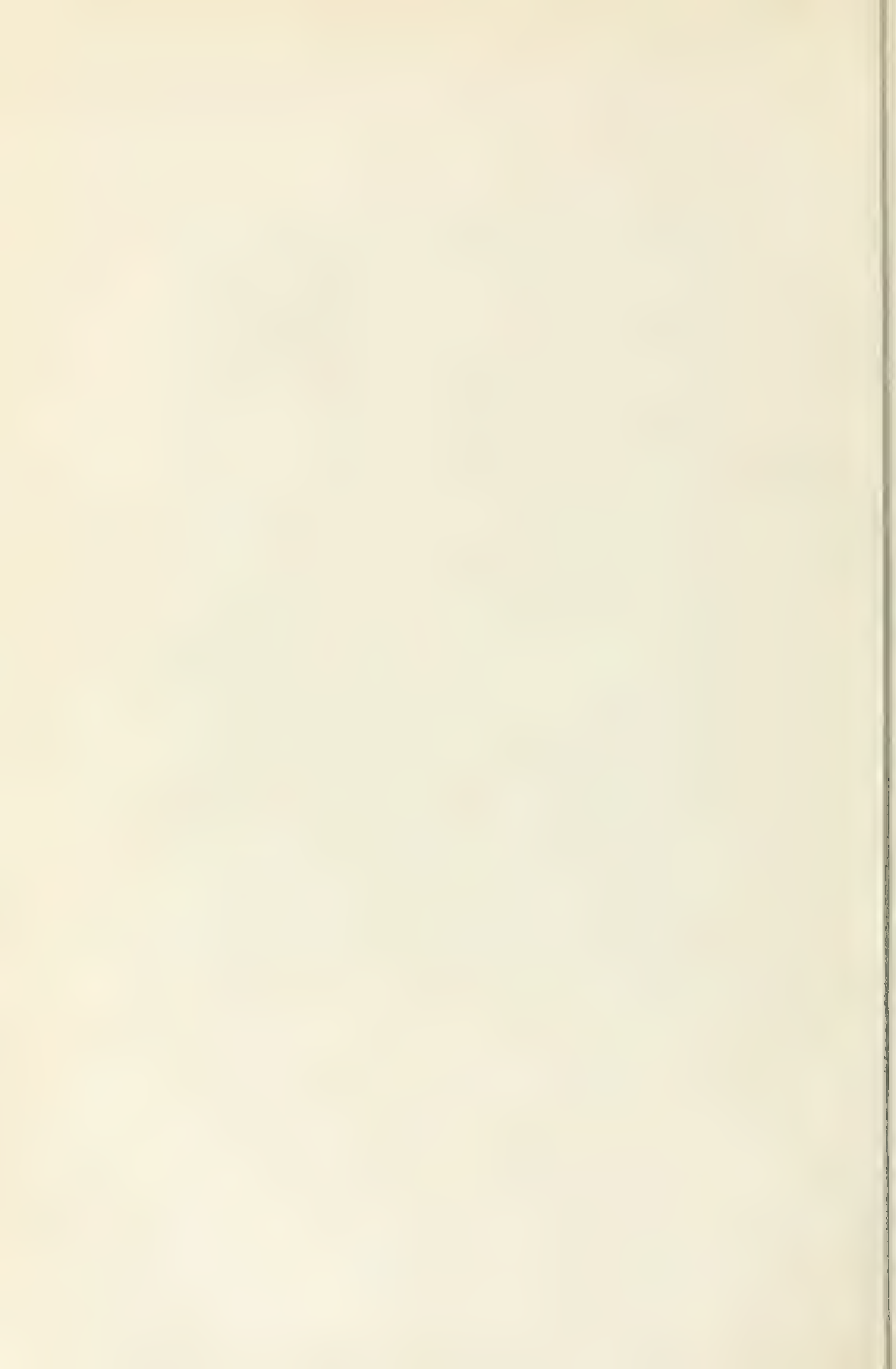




## 1010—MEASLES OF THE OX

Cysticerci embedded in the tissues of the heart. A, A', shows cysts deep in the musculature. B, B', shows cysts just beneath the endocardium. This is the cystic or resting stage of the parasite which forms the *Tænia saginata*, or the unarmed tapeworm of man.









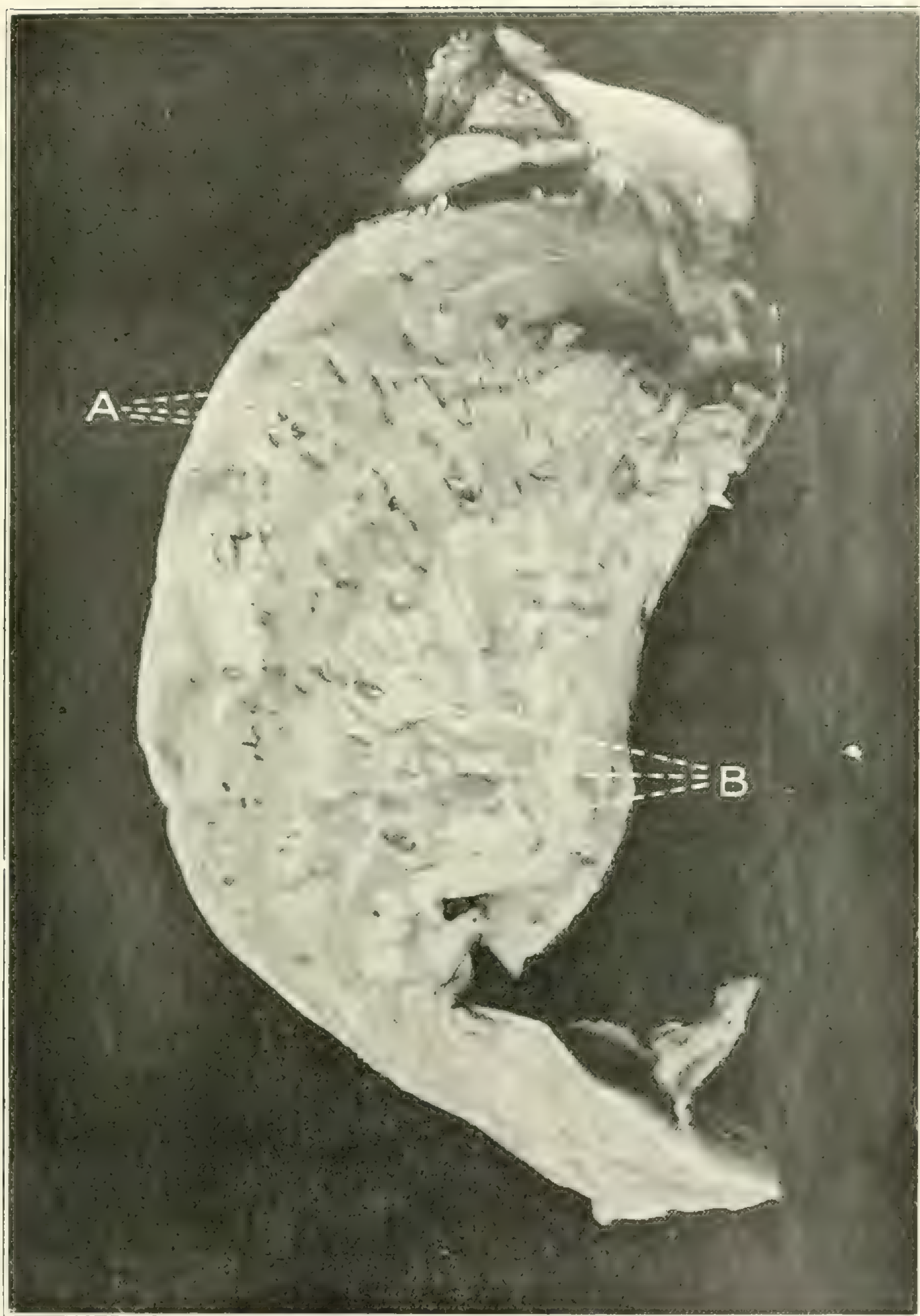
## 1269—MEASLES OF THE HOG

Cysticerci embedded in the heart. The cysts are very numerous and are readily distinguished in the photograph. This is the cystic or resting stage of the parasite which forms *Tænia solium* (the armed tapeworm) in man. Specimen forwarded by Inspector Ross.









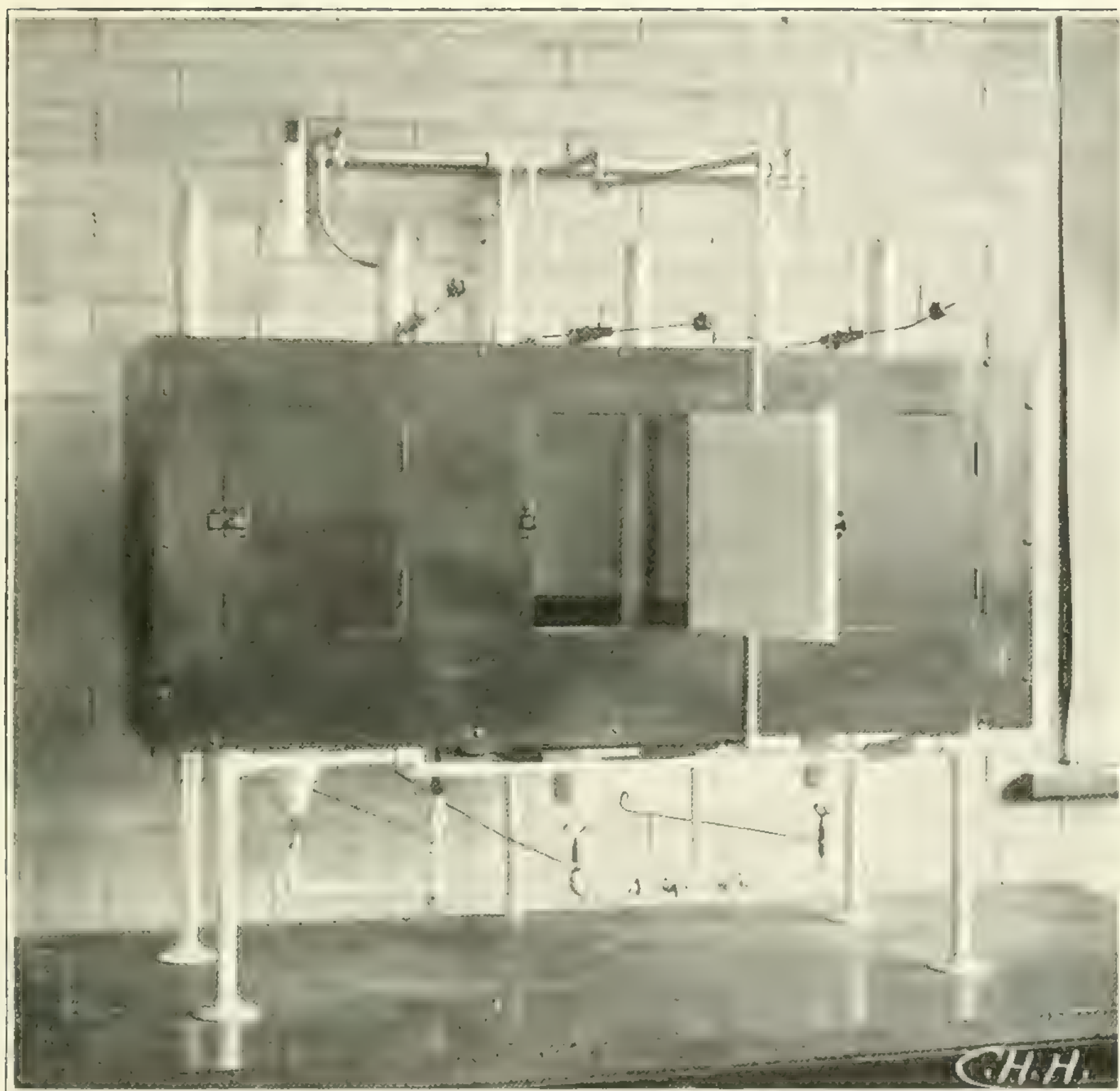
## 1269—MEASLES OF THE HOG

Cysticerci embedded in the muscles of the tongue. A, shows cavities left by the falling out of the cysts. B, shows the cysts in place. Specimen forwarded by Inspector Ross.



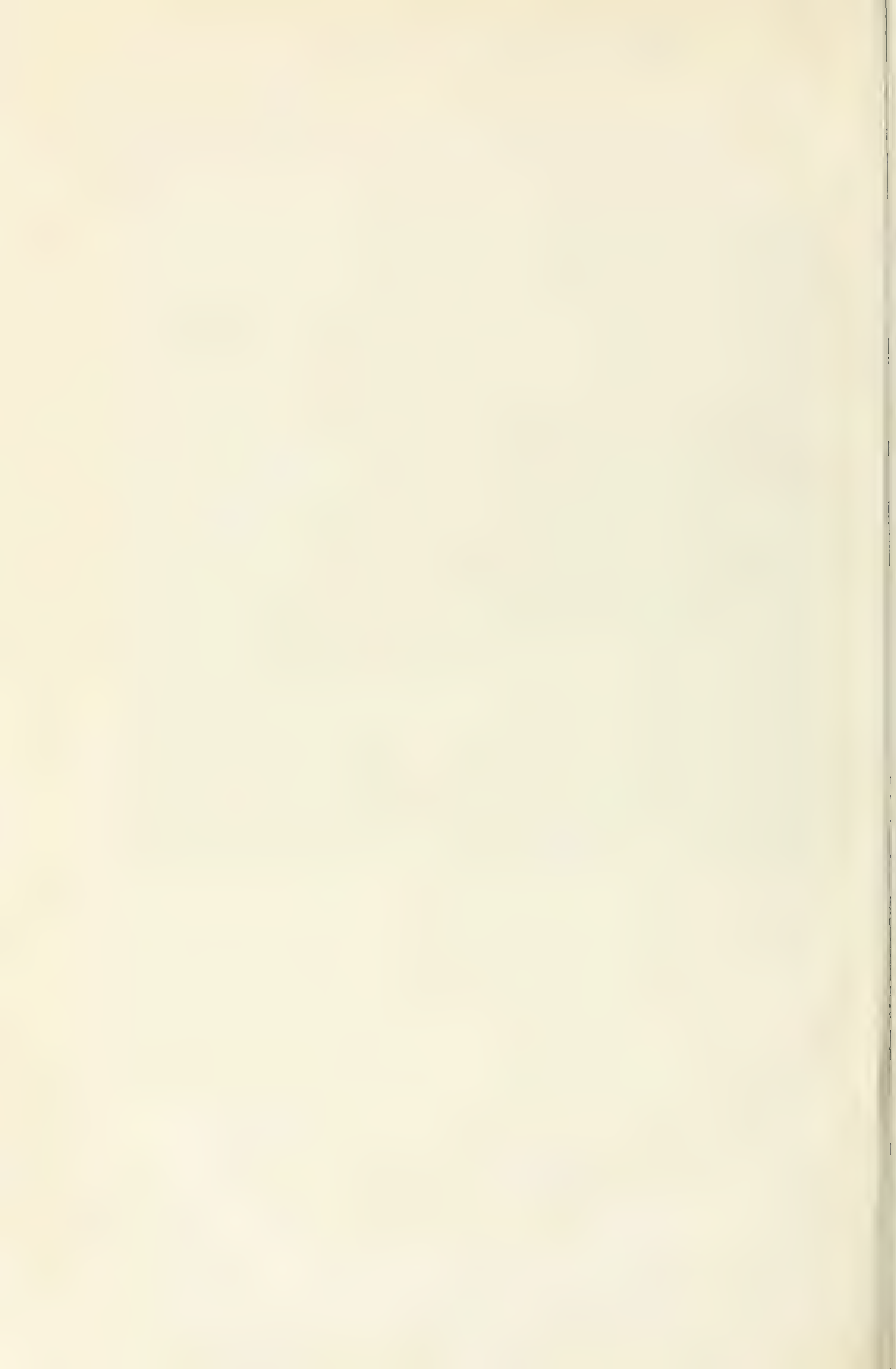




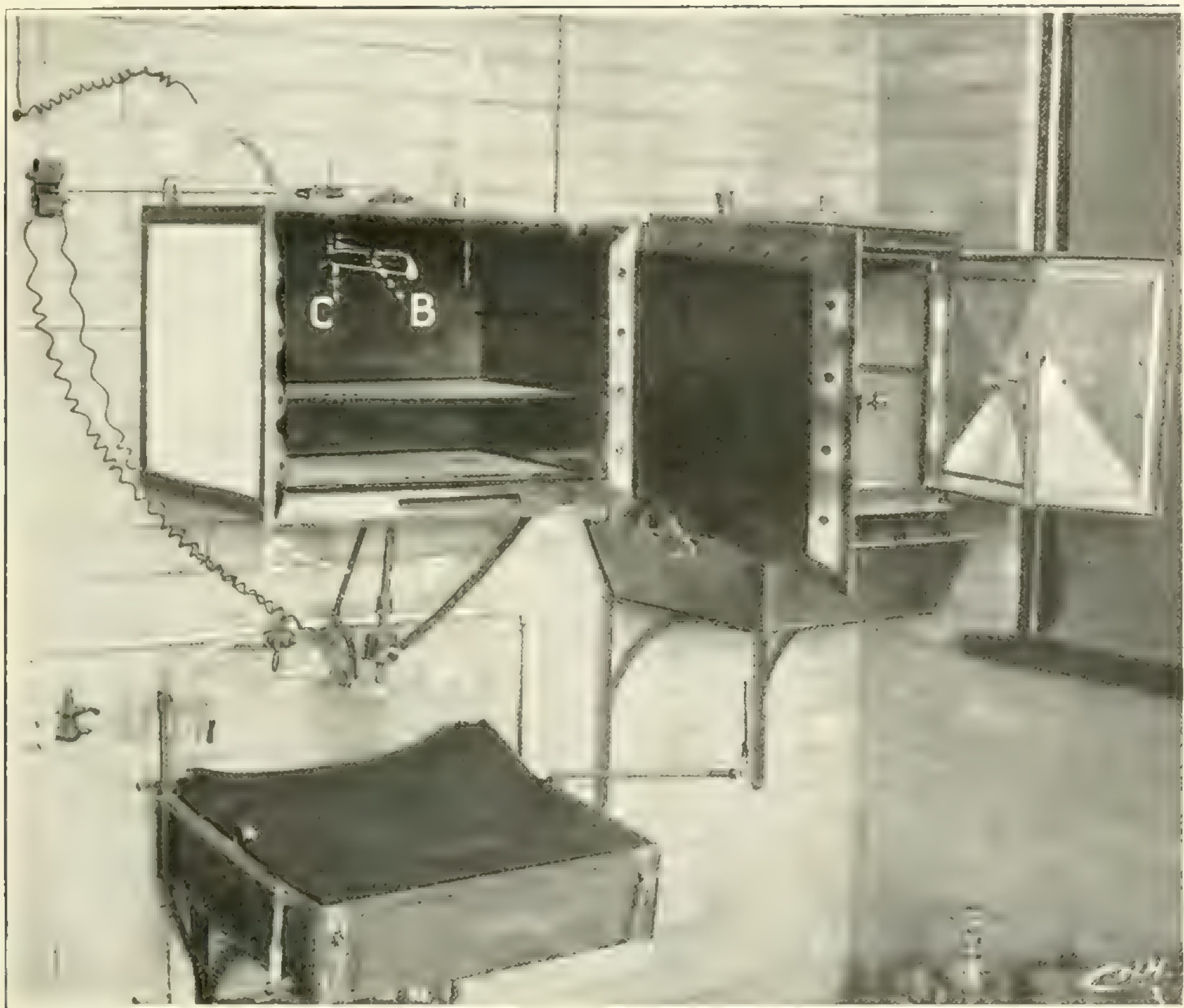


Incubators for maintaining constant temperature from  $30$  to  $50^{\circ}$  C. ( $=86-122^{\circ}$  F.). In this type of incubator the temperature expands a liquid confined between two brass wafers, and by a system of levers this is communicated, first, to the balanced lever shown at the top of the chamber, and from its end, by a wire, to the lever actuating the gas valve. Each of the three chambers may be controlled independently of the others. In the central one, the door of which is open, the attenuation of anthrax has been successfully carried out, and this fact in itself will indicate the accuracy with which the temperature may be maintained. (*See also Plate X*).









Hot air sterilizer, fitted with automatic controlling device which prevents over-heating. A is the automatic gas valve; B, the double wafers which are filled with a liquid expanding at the desired temperature; C, the lever which actuates the lever D; D, the lever making the electric contact at E which closes or opens the electric valve at A. F is the bunsen burner supplying the heat; and G is the pipe carrying the pilot light. The pilot light burns continuously when the apparatus is in operation, and lights the gas burner F when the gas is turned on.

The principle of controlling the heating device in the large laboratory incubator is similar to that shown and described above.







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*Remarks.*—The occurrence of carcinomatous tumours in bovines is not considered at all common. This is partially due to the fact that bovines are short lived animals and cancers are usually considered as tumour formations appearing in middle and later life. Kitt gives their frequency of occurrence among animals as compiled from statistics by Casper, Frohner and Sticker, as appearing most frequently in dogs (three per cent), horses next and then cats. They are infrequently observed in cattle, sheep, goats and swine. Cancer of the stomach and of the female urogenital organs in the human are far more frequently observed than in other tissues although primary cancer has been observed in all epithelial structures. Metastases may appear in organs normally containing no epithelial cells.

In the case of the tumour formation under consideration the localization of the tumour was doubtless due to the fact that the age of the animal had not provided the necessary time for metastases to form in other tissues or organs. The tumour is of particular interest on account of its infrequent occurrence in bovines.

*Sarcoma.*

Quite a number of sarcomata have been examined at the laboratory from time to time. Sarcomata are tumours made up of cells which retain their embryonic characteristics and whose tissues show no tendency toward maturation. One characteristic is the tendency to the formation of metastases which as a rule follow in the general direction of the blood current. Microscopic variations are also observed which in a large measure are due to the histological structure of the tissues in which they occur. Of the entire number which we have examined a few only will be mentioned from some of which coloured drawings have been made of their microscopical appearance.

1063. Forwarded by Inspector T. M. Pine, London, Ont. History. The animal in question was a steer slaughtered at an establishment under inspection and the location of the lesion was in subcutaneous tissue. The tumour was circular in form being six centimetres in diameter and one centimetre thick. The portion received was from the region of the hock, similar lesions extending up the quarter to within a foot of the tail. No lesions were observed in the internal organs or in the lymphatic system.

*Diagnosis.*—Sarcoma. A detailed study of the structure may be made from the coloured drawing (Plate II, Fig. 1.)

880. Specimen forwarded by Inspector Fisher from Carleton Place, Ont.

*History.*—The fish in question (Plate IV, Fig. 1) was caught in Mississippi Lake near Carleton Place and it is reported to be a usual occurrence to catch fish with similar tumours in this body of water which is really a broadening out of the Mississippi river at this point.

*Diagnosis.*—Some difficulty was experienced in arriving at a diagnosis but a detailed study of its microscopic structure has led to its being classed as a sarcoma. A drawing in colours is shown in Plate II, Fig. 2.

1066. Adeno-sarcoma. This specimen was forwarded by Inspector Walsh and is an example of a number which we have received showing a similar structure and involving the kidney of the hog.

*History.*—As all specimens of this class of tumour have been found at the post mortem examination of hogs slaughtered for human consumption, little is known of the previous history of the affected animal. The tumour mass in this instance weighed six ounces.

*Diagnosis.*—The microscopic examination revealed it to be an adeno-sarcoma and aside from the tumour mass a considerable portion of the kidney itself was involved. The detailed microscopic structure of the tumour may be studied in the accompanying coloured drawing (Plate III, Fig. 1).



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997. Melanosis.—A specimen forwarded for examination by Inspector Bruce.

*History.*—Strictly speaking this specimen cannot be considered as a tumour nor is it a sarcoma, being merely the abnormal deposit of pigment in tissues ordinarily free from such an invasion. As pigmented tumour masses usually develop into sarcomata it is described here. The autopsy finding of Inspector Bruce is included in the following letter of transmittal:—

MONTREAL ABATTOIR Co., November 19, 1907.

SIR,—I have the honour to inclose specimens of the hepatic gland, diaphragm, costal pleura and kidney fat taken from a red steer, age undetermined, and which I take to be a case of melanosis. The bones appeared to be normal and the carcass was well nourished. I may state that this is the first case that has come under my observation out of the thousands inspected since my arrival in Montreal.

I have the honour to be, etc.,

(Sgd.) E. A. BRUCE.

*Diagnosis.*—*Melanosis.*—The examination of various portions of the tissue invaded with this deposit revealed no abnormality in the arrangement of the cells. The pigment was easily distinguished as shown in Plate III, Fig. 2, and chemically responded to the tests for melanin. As melanin is the product of cell activity it is classed as a metabolic product.

1152. Melano-sarcoma. Specimen forwarded by Inspector Bruce from Hamilton, Ont.

*History.*—The letter of transmittal from Inspector Bruce furnishes all of the information which we have in this connection:—

HAMILTON, ONT., April 2, 1908.

SIR,—I beg to inclose herewith a portion of the abdomen of a male hog on which were black spots of a nature that I do not understand. I shall be glad to get a correct diagnosis as the condition is one that has not come under my observation previously.

I have the honour to be, etc.,

(Sgd.) E. A. BRUCE.

The spots referred to in the above communication covered but a very small area (6 sq. cm.) and were 0.5 cm. thick. They were nodular in shape, soft and intensely black in colour.

*Diagnosis.*—*Melano-sarcoma.* Microscopical examination revealed the structure to be that of a sarcoma accompanied by the characteristic deposit of melanin. No information was furnished as to the colour of the hog in question but the portion of skin received was white elsewhere than at the point of the tumour formation.

Many other tumour formations have been examined at the laboratory from time to time but so few representatives of any particular class are at hand that a report thereon would throw but little light on some of the obscure points concerning their occurrence in animals.

*Cysticerci. (Cystic form of tape worms.) (Measles).*

1010. *Cysticercus Bovis.* (Beef Measle).—This specimen (see Plates V and VI) was forwarded to the laboratory from Winnipeg by Inspector Fisher from a bovine badly infested with these parasites. It is of interest here as this encysted parasite when taken into the intestine of man develops into the *Taenia marginata*. A careful examination of the plates above referred to will enable a more detailed study of the lesions as they appear to the naked eye. Microscopically the head of the tape worm with its four suckers is very easily demonstrated in the contents of one of these cysts.



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1269. *Cysticercus cellulosae*. (Pork measles). We have a large number of specimens of this parasite but the specimen under consideration was forwarded by Inspector H. H. Ross from Hamilton, Ont. The photographs taken from the specimens received (Plates VII and VIII) show in detail the nature of an invasion with this parasite. Cysts of this parasite taken into the intestine of man develop into the *Taenia solium* or the most dangerous tapeworm of man. In man this tapeworm sometimes reaches a length of thirty feet.

The cysts contain the head of the parasite with its four suckers and crown of hooklets by means of which it attaches itself to the wall of the intestine, and these are very easily demonstrated by squeezing the cyst between two plates of glass and examining under a low power microscope or good magnifying lens.

The extent to which the muscles of the tongue may be involved is well shown in Plate VIII.

*Tuberculosis.*

Considerable time has been spent in the study of problems presented in connection with the experimental tubercular herd and with other phases of the tuberculosis problem in the lower animals. That in connection with the experimental tubercular herd is being prepared for inclusion in a special report on the subject. Some of the other phases of the tuberculosis problem with which we have dealt during the past year are of interest and one particular feature is worthy of mention at this time, namely, the increasing prevalence of tuberculosis among poultry. As the diagnosis of this disease is only possible where poultry raisers forward material to the laboratory for diagnostic purposes we of course do not learn of many losses of considerable extent. Since the identification of the disease in poultry forwarded to the laboratory from Enderby, B.C., as detailed in my report for 1904 a few cases have been dealt with each subsequent year and the disease has been found to be present not only in British Columbia but also in Alberta, Ontario and Quebec. No attempt has been made to follow up the history of the introduction of the disease among the poultry nor is there any evidence to indicate that one outbreak has been responsible for others. Mr. Gilbert, the poultry manager of the Experimental Farm, informs me that in one instance where the instructions given in a laboratory report were followed the disease was completely eradicated and that in another instance where the owner preferred to run the risk of losing his entire flock that losses have been constant and that the evidence available would indicate that this particular flock had been the source of a number of smaller outbreaks.

That the disease is highly contagious through the medium of the droppings is evidenced by the fact that in every instance the autopsy findings have revealed intestinal ulcerations discharging directly into the intestine and the droppings themselves have contained countless bacilli. From the habits of fowls it is evident that constant reinfection is possible and the autopsy findings would indicate that this does occur, therefore any measures for the suppression of the disease must be drastic and efficiently carried out that all infective material may be destroyed. The destruction of the fowls followed by thorough disinfection of the quarters and the ploughing up of the runs will usually prove effective. New stock should be raised from the egg and care taken to determine that the parent stock from which the eggs come is free from this or other diseases.

*Incubating Ovens.*

The construction of cheap serviceable incubating devices is a live topic to the enthusiastic pathologist whose desire for advanced knowledge is checked by the excessive cost of apparatus including that required to maintain his cultures at the desired temperature.



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Early in my study of bacteriology I found that incubators described by various manufactures were so high in price as to preclude the possibility of immediate possession and it was therefore necessary for me to provide a substitute within my means. Since that time, still keeping in mind my own early difficulties in this connection, I have experimented on various designs with a view of securing a device cheap in construction, but nevertheless, of such delicate adjustment that work requiring absolute control of the temperature may be undertaken with perfect satisfaction.

Such an incubator I have been successful in designing and a number have been in use for some years. Their simplicity is the strongest feature which they possess and they can be adapted for use with coal oil or alcohol lamps, as well as with the ordinary gases used for laboratory purposes. In my experimental work I have found that the water jacketed type of incubating oven possesses some advantages over other forms for certain classes of work, but that this new type of heating device will give results the equal of any that may be obtained by the most expensively constructed oven that it has been my privilege to examine.

The heater of this new type of incubator is constructed of ordinary iron pipe and cast-iron pipe fittings which are obtainable from any steamfitter. The incubator itself is simply a light wooden box with a tightly fitting single or double door. The box itself may be lined with metal and covered with asbestos if desired and should contain, aside from the apertures at the top and bottom for the open pipes of the heater, holes of a suitable size for thermometer and thermostat. The style of thermostat is immaterial but after years of experimenting I have equipped all of the incubators at this laboratory with a thermostat originally designed for chicken incubators, actuated by the expansion of a liquid hermetically sealed between thin discs of brass. The expansion of the liquid between these discs lifts a lever when the temperature increases, automatically closing the gas valve supplying the burner. By controlling the gas valve in this manner the difficulty so often encountered with a variable pressure of the gas is obviated. For the ordinary incubating temperature of  $37^{\circ}\text{C}$  ( $=98.6^{\circ}\text{F}$ ), gasolene or ether is the liquid used. As a liquid always has the same coefficient of expansion after the instrument is once adjusted no alteration is required. With other forms of regulators I have found continual adjustment necessary to compensate for the oxidation of the mercury or the molecular cohesion of the solid metal forms. Not only is it possible to utilize this style of thermostat for the controlling of the temperature in an ordinary incubator (three of which are shown in Plate IX) but it is also possible, by changing the liquid contained within the cavity between the metal discs to use them for a higher temperature as well and they are so used at this laboratory (Plate X).

The construction of the smaller incubators is so simple as to need no further description. If larger ovens of the same design are required then a specially constructed casting will be required for the distribution of the pipes used in the heating system. I have used the ordinary black iron pipe in preference to any other metal as it is cheap, will not burn out and is of such a thickness that it radiates a certain amount of heat when the door is opened. The continual stream of air passing through the pipes of this heater assists in the maintaining of a uniform temperature for when the chamber reaches the temperature at which it is regulated the gas is automatically turned down and the circulation of cold air through the heating pipes prevents the overheating of the incubating space.

For larger incubating chambers a different form of heater has been found to give excellent satisfaction as it is not usually possible to have your heating system beneath the chamber to be heated. In the large incubator room at this laboratory which is five by six feet and six and a half feet high, a three inch iron pipe is installed using the long elbows for the corners. Twenty-seven lineal feet of this pipe together with the necessary elbows for the conveyance of the heated air from the burner through the chamber maintains the desired temperature at all seasons of the year. This incubator has been in use for more than two years and a half and has given no trouble whatever.



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A hot water installation would have been much more expensive in its first cost and could have given no better satisfaction than I have obtained from this device. With the system in use there is very little danger of overheating while with hot water the water in the pipes and boiler are liable to become overheated when the door of the room is left open during the manipulation of the large cultures and the contained air is consequently over heated when the door is closed.

The controlling device in such a large incubator may be similar to that referred to where ordinary coal or gasolene gas is used, but the size of the opening in the gas valve will naturally have to be of a sufficient size to supply the large burner installed. With acetylene another factor enters which requires a decided change in the method of controlling the temperature. This factor is due to the quality of the gas which renders it impossible to reduce the amount of gas supplied to a heating burner in order to reduce the temperature. As it is necessary to have the burner full on or off, then a device must be used to meet this particular requirement. For this purpose I have successfully used an automatic electric valve in connection with a thermostat for regulating the current. This valve is so wired that when the contact is made and the valve turned the contact is immediately broken thus reducing the amount of current used in its constant manipulation. One of these valves has been in use for very nearly four years and is still rendering satisfactory service. I have found that for continued use it is necessary to use platinum for the contact tips for when other metals are used there may be an oxidation at the point of contact sufficient to interfere with its proper working.

Before making the installation of the heater in the present large incubator which is in constant use at this laboratory I considered the various devices and it appeared to me that each had defects not easily overcome. This installation continues to give satisfactory service and the temperature can be maintained within a fraction of a degree.

So satisfactory have all these incubators proven that I have no hesitation in recommending them to any one searching for a cheap method of satisfactorily maintaining a temperature at any given point.

In the foregoing report I have merely mentioned some of the more important features pertaining to my duties during the past year. It is nevertheless quite apparent to me that there are features of the work requiring a greater amount of attention than has been possible in the past and I trust that with the growth of the laboratory opportunity will be afforded for a consideration of these details.

The absence of Dr. Hadwen on leave since September last has deprived us of his services at a time when a trained assistant was required to supervise many details connected with the work of the laboratory. The research work which he has undertaken with Dr. Nuttall, of Cambridge University, will no doubt prove valuable to us on his return as he is taking up advanced work on the identification of ticks and other parasites concerned in the transmission of animal diseases.

The resignation of Wm. Laidlaw, V.S., at a time when his training had progressed sufficiently to enable him to assist with many details of the laboratory routine renders it necessary for me to assume the routine in addition to the manufacture of the biological products required.

In closing this report I may state that in spite of the unpromising outlook at the present time I believe that the year which we are about to enter will witness a further development of the laboratory and its importance to the work of the Branch so ably administered by you.

I have the honour to be, sir,

Your obedient servant,

CHAS. H. HIGGINS,  
*Pathologist.*



## APPENDIX No. 9.

E. A. WATSON, V.S.

REPORT OF THE EXPERIMENTAL (QUARANTINE) STATION, LETHBRIDGE, ALBERTA.

MARCH 31, 1909.

SIR.—I have the honour to submit the following, an outline of the research work in connection with certain diseases under investigation at the Experimental (Quarantine) Station, Lethbridge, Alta., carried out or in progress during the year ending March 31, 1909.

## DOURINE (MALADIE DU COIT).

The work on Dourine during the past year includes:—

(1) Further observations upon a number of mares that were pronounced affected with Dourine four to five years ago and in which the disease was diagnosed upon clinical symptoms alone.

(2) The experimental breeding of a number of the above mares that, to all appearances, had recovered from the disease, and observations upon the offspring of such mares that had been bred in the two preceding years in earlier stages of tolerance or apparent recovery; also, upon mares that showed marked symptoms of Dourine during the periods of pregnancy, and of their offspring.

(3) The continuation of several series of experiments commenced at the end of the year 1906 with the primary object of positively determining the suspected parasitic nature of the disease.

(4) Further demonstrations of the *Trypanosoma equiperdum* as the causative agent of Dourine.

(5) The maintenance of this trypanosome parasite in experimental horses and the study, through succeeding generations, of the habits, life history, variations in virulence of the organism, in its natural host, and of certain factors influencing its vitality and resistance under the foregoing and under artificial conditions.

(6) A comparative study of this Canadian variety of Dourine with those occurring in the old world.

(7) Experiments upon laboratory animals in attempts to transmit and maintain the infection and so to carry on the research work more fully and at less cost than when horses alone are utilized.

(8) A study of experimental Dourine in horses; particularly, of the incubation period, the primary symptoms, the intermittent type of fever, and of signs of the disease of possibly pathognomic and diagnostic importance.

(9) (a). A review of our present means of diagnosis.

(b) Experiments on horses with the object of arousing a latent infection into activity or inducing a reaction by which a satisfactory diagnosis could be arrived at, either on pronounced clinical symptoms or by detection of the parasite.

(10) Experiments with the blood and serum of horses in different stages of the disease and after recovery from it with a view to immunization, prevention and diagnosis.

(11) Experiments on the chemo-therapy of Dourine in naturally and artificially infected horses.



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It was recognized that the variety of Dourine with which we are dealing differs considerably from those occurring upon other continents and that it would be necessary to study it separately, from beginning to end, with the modifications and special features that characterize it in this country.

I have been able to repeatedly confirm my earlier observations on the specific trypanosome of this variety of Dourine by isolating the parasite from several different centres of infection, by reproducing the disease in healthy horses by inoculation of the parasite, and by observing the same upon many hundred of occasions in the blood or body fluids of equines naturally and experimentally infected.

The detection and study of the *Trypanosoma equiperdum* in its natural host is attended with the greatest difficulty and only at the expense of a great amount of time and labour. The periods of trypanosome activity in the accessible fluids are usually of rare occurrence, few and far between and of brief duration and even then, more frequently than not, the parasites are scanty in numbers. The preparation and tedious searching of thousands of films has been necessary and carried out and for every positive result there have been experienced many negative ones, but one of the former compensates for almost any number of the latter.

It is the knowledge gained of this blood haunting protozoan flagellate, the methods devised for determining its presence, and the production of experimental Dourine in horses that has made it possible to study the disease from its very commencement, to acquire facts and data of a reliable character and without which the greater part of this work could not have been carried out.

The course of Dourine, in general, in the majority of cases, is marked by alternating paroxysms and intermissions. The paroxysms, when they follow a short incubation period, may, for the first few weeks or months, be of a well marked type. They then become ill defined, appearing with less frequency and regularity, the intervals of intermission lengthening out from a week or two to one of many months' duration. Animals, that at one time have exhibited characteristic symptoms have regained perfect appearances of health. In several cases, however, relapses have occurred after nearly a year of health, while a number of animals have maintained an apparently healthy condition up to the present time,—from two to three years, during which they have been experimentally employed for breeding purposes. A number of healthy offspring have resulted from breeding, with certain precautions, to a healthy stallion, and, in one case, from breeding to a dourined stallion. A recovered mare, bred, and subsequently, at intervals during pregnancy, inoculated with *T. equiperdum* appears to have acquired an immunity and has recently, after a normal term, given birth to an apparently healthy foal. Another mare also appears immune, repeated inoculations of the Dourine parasite failing to produce any evidence of infection.

It is a matter of the greatest importance to be able to reach a decision as to whether an animal has permanently recovered or merely tolerates the disease, for one that is or apparently becomes immune but continues to harbour the parasite must, unless placed under certain restrictions, be considered as a real source of danger. Whether such an animal can transmit a lethal trypanosome or but one that has become greatly reduced in virulence and capable of producing only a mild infection cannot be fully answered at present. My experiments are showing that it is in the early stages of an infection that the parasites are most active and numerous in the tissues and fluids of the genital organs and that, as the disease advances or as the animal becomes indifferent to it, the parasites gradually disappear from these regions, rarely returning to it. Further, that when the parasite is successively transmitted from horse to horse during the early stage of the infections the length of the incubation periods is lessened, the disease tending to increase in severity, but when transmitted during a late stage or when an animal is becoming tolerant of it, the incubation period is greatly prolonged, the disease illdefined and scarcely possible to follow. In reporting on an



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outbreak of Dourine in Croatia Professor Kern has given statistics showing that, as time goes on, the danger of an infected stallion transmitting the disease diminishes. —(*Veterinary Journal*, Vol. 63, Page 751).

There are strong indications that recoveries from Dourine are not infrequent, but it is well to remember the remarkable analogy that exists between Dourine and Sleeping Sickness or Human Trypanosomiasis both in the nature of the diseases and the problematical recoveries that may follow them. A number of cases of recovery from sleeping sickness have been reported within the past few years but there are now frequently coming to hand the reports of cases that have relapsed after intervals of from one to several years of perfect health. Recoveries are therefore regarded with the greatest suspicion; indeed, the question is raised in the latest issued Bulletin of the Sleeping Sickness Bureau (Bulletin No. 7) 'of how many can it be said that their recovery is permanent?' and, 'Is there any evidence that a single case of cure in man has taken place?'

The possible duration of a trypanosome infection in man and animals without the betrayal of any definite sign of its presence is, without doubt, an exceedingly long one. The utmost caution must be used in freeing an animal that has been justly suspected or in pronouncing a permanent recovery, for such animals may be carriers of the virus for unknown periods. Our knowledge of the parasite of Dourine is still very incomplete and until more facts can be referred to and a criterion of cure or recovery fully established, it will surely be safest for all practical purposes to consider an animal that survives infection as still a carrier of it, and, in the light of its capability of spreading the disease, when given the opportunity, as but a few degrees less dangerous than the newly infected stallion or mare .

The investigation of Dourine in Canada has now been in progress for several years and it may be thought that results are slow in forthcoming. The above sketch and comments indicate to some slight extent the nature of the disease, the difficulties that are met with in studying it, and the necessity of greatly prolonging periods of careful observation before arriving at conclusions. An intermediate report, to which the foregoing is an introduction, is now in preparation and will be ready to submit to you, I hope, at an early date.

The investigation of the disease known as loco-poisoning continues. I have already submitted a preliminary report on the disease, under date of November 1, 1908. Since then a number of experiments have been carried out, although I have been unable to give the subject the full time and attention that it requires.

The results and theories of the workers investigating loco-poisoning for the United States Bureau of Plant Industry are very interesting to us, particularly the claim that the disease is a form of barium-poisoning and that the loco plants are harmful according to the amount of certain salts of barium they contain. .

Up to the present I have not been able to produce the symptoms or condition that characterize the disease in this country by feeding barium salts to horses, nor by feeding certain loco-plants to horses and rabbits. The experiments, however, have not yet been sufficiently numerous to permit of further statements or conclusions.

I have the honour to be, sir,

Your obedient servant,

E. A. WATSON,

*In charge of Experimental Station.*

To the Veterinary Director General,  
Ottawa.



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## APPENDIX No. 10.

E. A. WATSON, V.S.

THE QUARANTINE STATION,

LETHBRIDGE, ALTA., March 31, 1909.

SIR,—I have the honour to submit herewith a Preliminary Report on the Loco Disease of horses and cattle in the province of Alberta.

It may be thought that a further contribution to the already extensive literature on the subject of loco-poisoning, unless it contains a solution of the problem or at least an hypothesis that is calculated on a basis of facts to lead to such a result, is unnecessary. However, so many different and contradictory opinions exist concerning the cause, nature and spread of the disease, that it seemed to me advisable to describe in detail such facts and points of interest as have been ascertained relative to its occurrence, and the symptoms and pathological conditions observed in affected animals, in this province.

A few references have been made to some of the results of other investigations of importance, and some discursory remarks on loco weeds and the causation of the disease, in the hope that this report may be of some assistance in the further study of the loco-problem.

Drs. G. Hilton and D. Warnock, in September, 1907, selected a number of affected animals in the Porcupine Hills district for removal to the Quarantine Station, Lethbridge. Much difficulty, I am told, was experienced in the collection and removal of these animals, a number becoming unmanageable and were either killed or abandoned, only thirteen reaching their destination. Drs. Hilton and Warnock have already recorded some of their observations on loco disease, and I am much indebted to these gentlemen for the history of the animals sent here and for other valuable information. It is also a pleasure to acknowledge the assistance and hospitality of the stockowners who have supplied the animals for experimental purposes and through whose kindness I was enabled, on a recent visit, to examine a large number of cases. Dr. J. Fletcher, Ottawa, has kindly identified specimens of loco-plants that I had submitted to him.

In the animals sent to this station I did not consider it advisable to attempt much in the way of medicinal treatment but to keep them under constant observation, note the effects of an entire change of range and forage conditions, and gain some accurate knowledge of the course and pathology of the disease. I have also given considerable attention to the possibility of the disease being of an infectious nature, and have made a great number of blood examinations and not a few experimental inoculations, without obtaining any evidence in support of such a view.

The experimental feeding of healthy horses and cattle with the suspected weeds has not been carried out as yet. I have only recently been able to secure small quantities of the loco weeds grown on the disease affected ranges, but several stockowners have promised their assistance in this matter this next spring.

Feeding experiments in healthy range stock, a close study of the "loco-habit" and the conditions giving rise to it, and experimental treatment of affected animals should, I respectfully submit, receive attention, and could more profitably be undertaken in the affected districts where opportunities for such work are practically unlimited, than at this distant station. At the same time it would be of interest and importance to determine here whether the loco weeds that are quite plentiful in these



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pastures, when fed to healthy horses and cattle are capable of producing a similar disease to that now occurring in the Porcupine Hills.

I have the honour to be, sir,  
Your obedient servant,

E. A. WATSON,  
*In charge of Quarantine Station.*

To the Veterinary Director General,  
Ottawa.

#### LOCO-DISEASE.

There is an abundance of literature\* concerning in one way or another loco-disease and loco weeds, but marked absence of agreement in the conclusions arrived at by different investigators. It is sufficient to say that all enquiries conducted with the object of determining the essential cause and the pathogenesis of the disease, and the application of knowledge so gained as a basis on which to devise remedial and preventive measures have, though productive of interesting and valuable hypotheses, more or less failed in their chief endeavour. The suspected weeds have been analysed time and again by experts, but without success in isolating or extracting a specific agent or toxic principle to which the disease could be attributed, with one notable exception detailed below.

A microbe, a parasite, pathogenic moulds or fungi attached to and drugs or chemical poisons contained in the loco weeds, have each been considered as possible causative factors but investigations along such lines to whatever extent carried out have been productive of equally negative results. The exception referred to is the recent work of Dr. A. C. Crawford\* who has succeeded in demonstrating the pharmacological activity of certain loco plants in feeding the extractives to rabbits; also, that these extractives contained barium, that rabbits fed barium salts exhibit similar symptoms as when fed the extracts of barium containing plants, and that these symptoms again are analogous to certain of those described in affected stock on the range. Thus, the co-relation of barium-poisoning and loco-disease experimentally produced in rabbits in the laboratory appears to have been demonstrated, but it is well to remember that a comparison of the symptoms occurring in laboratory animals with those chronic conditions that obtain in loco-affected horses and cattle is very difficult and liable to errors. Proof that loco disease in stock on the range is a chronic form of barium-poisoning has not yet been furnished, although it is anticipated from the statement by Dr. C. Dwight Marsh, (U.S. Bureau of Plant Industry Bull. No. 121, p. 37) "that it was clearly proved that *Aragallus lamberti* would poison horses, sheep and cattle, and that *Astragalus mollissimus* would poison horses," together with the introductory statement to the laboratory work of Dr. Crawford's that the result of the loco investigation in the field will furnish such evidence, and the publication is awaited with much interest.

Should it be definitely established that the eating of barium-containing forage plants is an important cause of loco-disease, then, new problems and certain lines of work are suggested in dealing with various forms of forage-poisoning in animals, and, very probably in similar diseases in man, such as Pellagra, Lathyrism, etc.

Loco-disease has been known for many years, and by all accounts is responsible for large annual losses in stock in several of the states bordering the slopes of the Rockies from Montana to Mexico. The belief that the disease in these states is associated with the 'loco-habit,' that is, the acquired appetite for certain plants known as

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\* A very complete citation of literature, and the full details of Dr. Crawford's experiments may be found in U.S. Dept. Agric. Bureau of Plant Industry Bulletin No. 129, August, 1908.



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loco or rattle weeds, seems to be well founded, but that the action of a poisonous constituent of these plants on the body tissues is directly the starting point and subsequent manifestation of the disease, is at present an hypothesis that has to be further supported by scientific facts before it can be wholly accepted and applied.

*Occurrence of the Disease in Canada.*

From time to time in years gone by, locoed animals have been brought into this country from one of the states to the south by speculative purchasers who claimed that an entire change of range conditions would result in recovery for a fair number of the affected animals. Of the natural occurrence of the disease in Canada I have been unable to obtain any reliable information prior to the year 1900. The disease is said to occur to a small extent in the province of Saskatchewan on the range of the southern slopes of the Cypress Hills, and in certain districts bordering the Saskatchewan River. In the province of Alberta it appears to be confined to the Porcupine Hills district.

Dr. D. Warnock, of Pincher Creek, Alta., has kindly furnished me with a map showing the loco-affected district in the province of Alberta, and which he describes as follows:—

“Infected area consists of the following townships, viz:—Townships, 11, 12 and 13, Ranges 28 and 29 west of the 4th Meridian and lying south of Willow Creek. Comprises districts known as New Oxley, Lyndon and Meadow Creek.

Townships 7 (that portion of 7 lying north of Old Man's River) 8, 9 and 10, Ranges 27, 28, 29 and 30, West of 4th Meridian and west of Macleod branch of C. & E. Railway. Comprises districts known as Summerview, Beaver Creek, Tennessee Coulee and Jack O'Neill Coulee.

Townships 8, 9 and 10, Range 1 west of 5th Meridian and north of Old Man's River and east of Livingstone Range of Mountains. Comprises district of Livingstone.”

It will thus be seen from the above statement that the loco-affected district includes about 25 Townships and is bounded on the North by Willow Creek, on the south by the Old Man River, on the east by the Macleod branch of the C. & E. Railway, and on the west by the Livingstone Range of mountains.

Most of the ranchers interviewed, living in the district mentioned for the past ten to twenty years state that they never observed a locoed animal prior to the year 1900. A few expressed the opinion that sporadic cases did occur at an earlier period. In the year 1901 the disease appeared in certain herds of stockers that had been imported to the district and in the following year or two a high percentage of their progeny became affected as well as a number of native range cattle. In horses, no information could be gathered that the disease occurred prior to 1903-4, since when, a large number, more particularly the yearlings and two-year-olds have acquired the sickness, and the recent losses reported both in equines and bovines are very great.

The following information has been furnished by stockowners, and will convey some idea of the spread of the disease and the losses sustained:—

(a) Mr. T. M. B. commenced ranching in this district in 1906, and in that year 5%, in 1907 15%-20%, and in 1908 over 30% of his cattle were affected with, and had mostly succumbed to loco-disease.

(b) Mr. T. B. places his loss in cattle at 75-80 head, dating from 1901-1903. His horses were not affected until two years ago, and in eighteen months he lost 17 yearlings or two-year-olds, comprising nearly all of his young animals.

(c) Mr. H. had been running a small herd of cattle for eleven years and first experienced the disease in 1907. In eighteen months he has lost 36 head, practically all of his one and two-year-olds, and some of this season's calves are already showing symptoms of the malady.



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(d) Mr. A. R. stated that in three years 1901-1904 he lost from 60%-75% of his cattle, and then disposed of the remainder and his ranch.

(e) Mr. W. H. C. stated that in the winter of 1906-1907 he weaned his foals, and hand-fed these and his yearlings with a generous diet of green oats and hay, and that the animals on being turned out to pasture in the spring of 1907 were in excellent health and condition, but a few weeks later developed symptoms of loco-poisoning. A number succumbed in the second and third month of the disease, the total loss for twelve months being 36, all yearlings or two-year-olds. The foals born in this same year remained in good health until the summer following (1908) when five of the fifteen were found affected, three succumbing. In 1907 five calves at six months of age were showing characteristic symptoms, and died within the twelfth to the eighteenth month of the disease, and a number of the calves of the same year which then escaped the sickness have now acquired it as yearlings.

A number of similar experiences could be cited, but the above will serve as average samples.

The percentage of animals affected in certain herds is reported by stockowners as higher in 1907 than in 1906, and still higher in 1908 than in 1907. The total losses in 1908 may not be greater than in the preceding years, as a large number of young stock have been sold or slaughtered, no fresh stock imported, and the number of cattle now raised on this range not nearly as great as formerly.

One rancher who is experiencing heavy losses is raising a large number of pigs, which subsist almost entirely on the carcasses of his locoed animals, and appear to thrive well on the diet.

#### *Concerning Loco-Weeds and the causation of Loco Disease. Notes and discussion.*

The weeds suspected of producing the disease are found usually to belong to one or the other of the botanical groups *Astragalus* and *Aragallus*. In past years a large variety of leguminous plants growing on the ranges of Alberta and Saskatchewan have been pointed out to me as loco weeds, by stockmen from Colorado, Wyoming, or Montana; their descriptions of the disease I found as variegated as the plants to which they attributed it.

More or less empiric views regarding the relation of the "loco-habit" to loco disease may be summed up, chiefly, as follows:—

(A) That the *loco-habit* is acquired (a) through the over-stocking of the range, and, from the scarcity of normal forage, animals being forced to eat the loco weeds, (b) by one animal imitating another, (c) by hereditary predisposition.

(B) That the habit once acquired, persists, and that affected animals if only temporarily removed from the range, will revert to it, and will pick out these weeds whenever possible and eat them in preference to grass or proper fodder.

(C) That the loco-eating habit results in what is known as loco-disease, or, at least, in the production of those symptoms associated with the central nervous system, and malnutrition, leading to death.

(D) That the loco plants are always present and in abundance where ever the disease exists.

(E) That the loco plants are always absent from those stock ranges where the disease is unknown.

It is perhaps scarcely necessary to include this last, and it may be disposed of at once as a totally wrong conclusion for numerous observers have reported the prevalence of loco weeds in districts where the disease is quite unknown. In a bulletin entitled "Weeds of the Farm and Rancho" \*<sup>1</sup> it is stated that two species of loco weeds *Oxytropis lamberti* and *O. splendens*, are abundant from Manitoba to the Rock-

\*<sup>1</sup> Bulletin No. 7. Govt. of the Province of Saskatchewan, Dept. of Agriculture.



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ies. Again, in another Bulletin, \* the "White Loco" is distributed over nearly the whole plains region of the United States from Alberta and Assiniboia south to Mexico, and from Minnesota and Kansas westward to the Rockies." I might add that I am personally familiar with several stock ranges in Alberta and Saskatchewan where the loco weeds are very prevalent, and where the forage plants and grasses appear less prolific than on the ranges in the Porcupine Hills, but on the former so far as I am aware the disease is still unobserved. The foregoing is mentioned as it is still frequently asserted that the plants are only found in the diseased areas. This view is sometimes modified in that it is not the prevalence but the abundance of loco weeds on close eaten stock ranges that causes the sickness. A more probable explanation, I think, lies in the fact recently brought forward by Dr. Crawford that "Loco plants grown on certain soils are inactive pharmacologically and contain no barium."

From all accounts the Porcupine Hills district had proved for many years to be a most profitable range for the raising of cattle and horses, but since 1901 loco disease has spread to such an extent within this particular district, and there is good reason to believe, is including a wider area each year, that the industry has become much curtailed. Certainly, the scarcity of grass and forage as a predisposing cause of the loco-habit cannot be advanced as a reason for the large number of young animals that have become affected during the summer and autumn of 1908. On my recent trip of September of this year I found the range, to all appearances, in excellent condition. There was an abundance of grass, and over large areas where affected animals were seen grazing it would have been possible to cut from four to six or eight tons of hay per day, with a single mowing machine. Notwithstanding, several stockowners stated that the number of their animals that are affected with, or had succumbed to, loco disease, during this past season, is twice as great as in the preceding year 1907. Within the space of two years from one-third to two-thirds of the total number of animals in certain herds have become diseased.

It is sometimes remarked that heavy losses are occurring on a certain range or pasture while adjoining ranges, separated from the former only by a wire fence, remain free from the disease. The following is a case in point:—Mr. J. C. has 90 head of cattle and 26 horses, his range and pastures are in close proximity to those of Mr. W. H. C., the former has entirely escaped the malady while the losses upon the latter within two years amounted to 36 horses and 8 cattle. A brief examination of these ranges did not reveal any material difference in the forage conditions, and the loco plants appeared to be as abundant upon one as the other. Mr. J. C. stated that he kept his animals within fenced pastures in the winter and herded them on the range in the summer, driving off any locoed beast that appeared in their vicinity. However, certain ranchers that were congratulating themselves on the freedom of their animals from disease while those of their neighbours suffered severely, have recently discovered that their immunity was of a very temporary nature.

The species of plant which is most concerned in causing loco disease in Montana is said to be the *Aragallus spicatus*, closely related to *Aragallus lamberti* \*<sup>1</sup> A similar species of plant \*<sup>2</sup> is generally pointed out or referred to as the cause of the disease in the Porcupine Hills. (*Astragalus mollissimus* is also prevalent in the same localities.) This plant, as well as some others belonging to the same botanical group, grows abundantly on the hillsides in the Quarantine Station pastures, near Lethbridge, and on ranges in this vicinity. Seven horses and six cattle, all showing symptoms of loco-disease, were collected in the Porcupine Hills district and sent to this Station a year ago; in the horses I have been unable to detect an appetite for

\* Bulletin No. 45. Montana Agricultural Experiment Station.

\*<sup>1</sup> Bulletin No. 26. U. S. Dept. of Agric. Div. Bot. "The Stock-poisoning Plants of Montana," Chestnut and Wilcox.

\*<sup>2</sup> Identified by Dr. J. Fletcher, Botanist Cent. Expt. Farm, Ottawa, as *Oxytropis Lamberti*.



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any of these loco-weeds, rarely they were seen to eat one, or a portion of one, included with the grass apparently by accident. The cattle have at times been observed to eat plentifully of a certain weed, one severely affected steer in particular seeking this out, but it did not belong to either the *Aragallus* or *Astragalus* varieties. All the horses and two of the cattle have succumbed to the disease.

While the symptoms occurring in equines and bovines offer some points of difference, they are, on the whole, very similar, and in all probability are produced by the same cause, though a few stockowners take an opposite view. The chief reason for the latter, apparently is the fact that up to the present some owners have experienced the disease only in cattle while running horses under similar conditions. The loco disease in Montana is peculiar in that sheep and horses are the chief sufferers, rarely cattle;<sup>1</sup> it is said that a number of ranchers in that State because of the losses from loco, have sold their sheep and restocked with cattle, as the latter are so little affected.<sup>2</sup> In Alberta cattle were the first to become locoed, subsequently horses; it is not known whether sheep are susceptible as these animals are not grazed within the affected area. Concerning loco weeds, it may be mentioned that an "old-timer", a trader with the Indians in former days, stated to me that twenty years ago, in Alberta, he had often noted the Indians removing loco weeds when picketing out their horses. I interviewed several old Indians on this point, showing them samples of the weed (*Aragallus lamberti*), which they recognized as one of their favourite medicine plants, explaining that when they gathered it, it was not to prevent their horses from eating it, but for their own uses, drinking the infusion as a remedy for sore throat, lung troubles, tooth-ache, etc.

In dealing with the loco problem in Alberta it should be remembered that the number of animals affected is increasing each year, and that the affected area, though confined to a comparatively small district of the western stock ranges, is gradually extending its limits. It is scarcely possible that such a large number of young animals are becoming locoed merely from acquiring the habit by the imitation of those affected by it. Neither can predisposing causes be traced to heredity, for, with few exceptions, the dams have remained in health while their offspring frequently for several successive years have suffered and died from the disease. And besides, locoed animals rarely live long enough to bear offspring, or, if the dam becomes affected after conception abortion is said to be the usual event to follow.

"Loco-disease", in my experience, includes a plurality of pathological conditions emanating from a plurality of causes and complicated by one or more parasitical or infective diseases, the latter often in severe form; the investigation has not proceeded far enough to determine with certainty which are the original or exciting causes and which the sequelae. The symptoms of loco disease indicate serious errors in metabolism, the predisposition to which, it seems to me, probably arises not from the lack of quantity of forage but from the lack of certain inorganic constituents in that forage, especially required in the metabolic processes concerned in the building up of the tissues in young animals, the physiological necessity and craving for these absent elements resulting in their substitution by others of an harmful nature contained in the loco plants or alkaline deposits, hence the depraved appetite, loco-disease and parasitical infections.

The symptoms in loco disease will bear a comparison with those occurring in Cretinism and Myxoedema in man; errors in the internal secretion of special glands such as the thyroids and the pituitary bodies may account for certain of the nervous phenomena and the peculiar condition of the head in locoed animals. In the few cases in which I have examined these special glands the thyroids were found atrophied, and in one case the pituitary body much enlarged.

<sup>1</sup> "The Stock-poisoning Plants of Montana", V. K. Chestnut and E. V. Wilcox.

<sup>2</sup> "The Loco and some other poisonous plants of Montana," J. W. Blankinship.



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The foregoing may appear to be an unnecessary multiplication of possible causes and relations, but I believe there to be a number of factors at work in the production of this malady and that a remedy, if found, will be applied not only as an antidote to barium or some poison in the loco weeds but as a restorative of normal metabolism and internal secretions.

## SYMPTOMS.

The following deals only with the symptoms occurring in horses and cattle in Alberta, and is the result of the observation of the disease in a large number of animals in the affected district, the Porcupine Hills, but especially in thirteen animals that were collected in this district and sent to the Quarantine Station, Lethbridge.

1. In *Equines*. Young animals from six to eighteen months of age are the most susceptible, and in these a rough, staring coat, in yearlings the non-shedding of the winter's coat, poor appetite, and general unthrifty appearance may either precede or follow cerebral and neuromuscular symptoms. It is usually by the symptoms that are associated with the central nervous system that the disease is first recognized by stockowners. Restless, wandering habits, with sleepiness and some depression, alternating perhaps with short periods of excitement or mania, may be the first signs noted, concurrently with disturbances in nutrition and alimentation. In this stage animals are inclined to separate from the herd, which they can be made to rejoin, or driven in a desired direction, only with much difficulty or not at all. Young colts, well halter-broken and gentle, under the influence of the disease become nervous and excitable. They may for a time submit to having the halter placed about the head but stubbornly refuse to be led, tension of the rope causing the animal to spring backwards, or rear up and fall over, and before long they show a terror of the rope and become quite unmanageable. Later, however, they become quite indifferent to light touches of the whip, knocks, pin-pricks, etc.; this is the stage of depression and stupor, in which even unbroken horses may sometimes be handled and pushed about at will, though it is well to be on ones guard for at any moment, without warning, the subject may suddenly leap into the air, striking against a rafter, the side of a building, fence post, or anything that happens to be nearby. Mental derangement and inco-ordinate muscular action form the most constant and characteristic symptoms of the disease. The peculiar gait is at once remarked upon, locomotion being performed slowly and with deliberation, accompanied by overflexion and extension of the limbs. The head is carried low, the arm lifted high, so that the knee and chin are nearly horizontal and in close proximity. The animal appears to be walking over invisible obstacles, and if driven fast, will frequently stumble and fall, though the ground be perfectly level. When the condition is very severe it is almost impossible to force him out of a slow walk, if urged he becomes excited, moving the limbs up and down upon the said spot, 'marking-time' as it were, or moving forward only a few inches at a step.

Visual errors are common. The loss of the sense of direction is well-marked. When it is attempted to drive an animal in a particular direction he will travel in semi-circles, and run into wire fences or gates. I have seen a locoed steer walk over a cutbank and fall a distance of fifteen feet into the creek below. An animal is sometimes unable to locate a dish of oats or salt placed before him, the attempts being often ludicrous. A glassy, staring expression of the eye is very frequently noticeable, not a truly amaurotic condition as the eye remains sensitive to light, but probably a result of the defective action of the ciliary muscle and consequent loss of power of accommodation and focus, and distortion of the image, rather than from paralysis of the optic nerve and retina. In the later stages changes in the anterior chamber and cornea may be noted, having the appearance of a thin bluish-grey film, translucent rather than opaque.



Lachrymation is often profuse and may continue for weeks or months in remissions. The upper and lower eyelids become swollen, especially the lower which are sometimes everted, and, fragments of hay, &c., entering, give rise to a severe conjunctivitis, and purulent discharge.

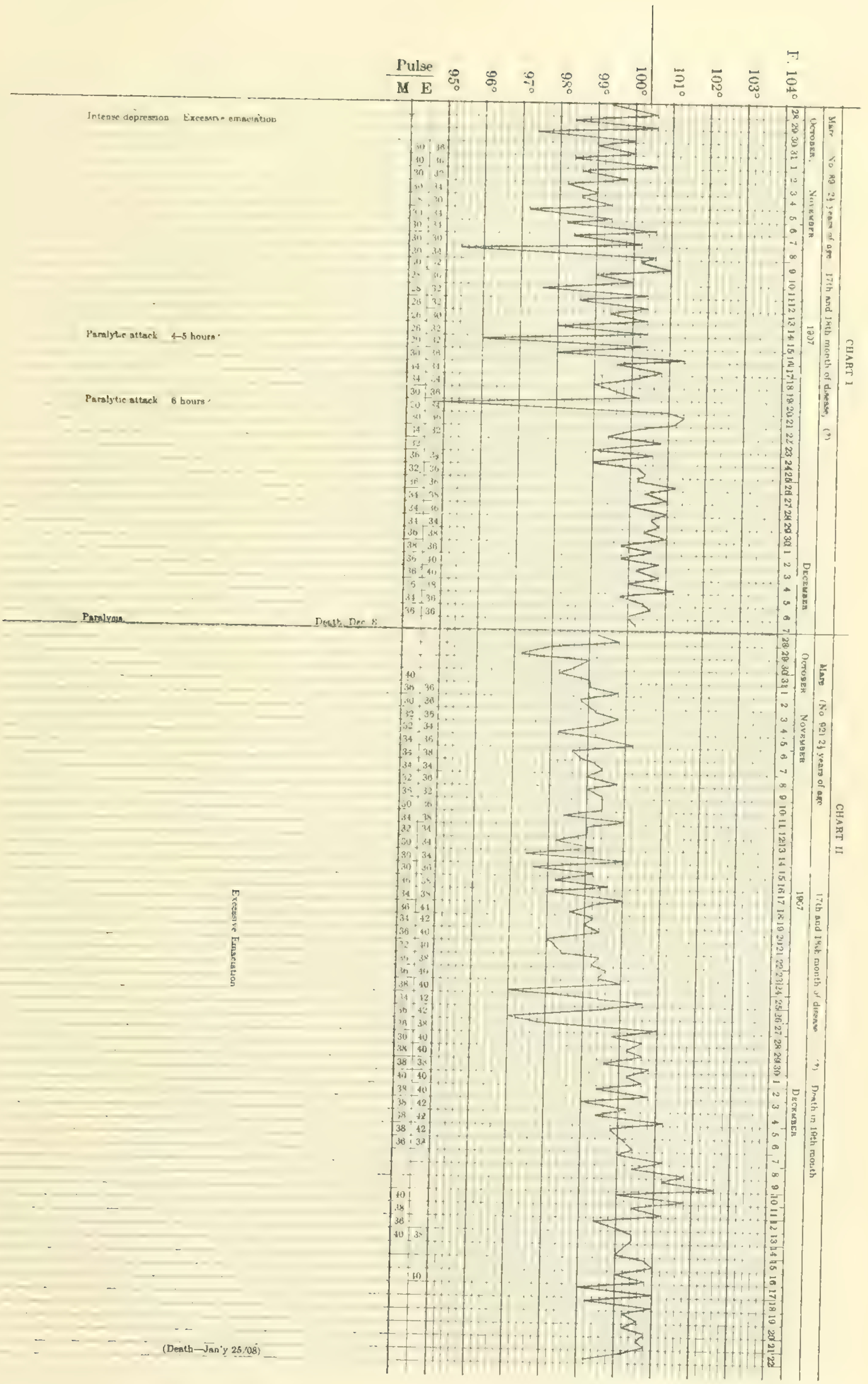
Trophic and secretory disturbances, probably dependent upon nervous influence, are an important feature of the disease. Glandular activity is at first increased, later diminished. Different portions of the body are unequally developed. The head is relatively large, the face is devoid of expression, and has a puffed appearance; especially the eye-lids, cheeks, and muzzle are swollen, the swellings being firm and hard (solid edema) not pitting on pressure. The powers of prehension and deglutition are considerably interfered with, and, in advanced cases, the mouth may constantly be found packed with food, and a wisp of hay left protruding between the lips. If the mouth be examined there will be found more or less evidence of stomatitis in a catarrhal aphthous, or an ulcerous form. The muco-cutaneous margin of the lower lip is rarely free from erosions, and these may be quite extensive or penetrating. Constipation is the rule, sometimes alternating with diarrhœa, retention of urine is occasional, but rare. The disturbances of the digestive system are much complicated by infestations of the alimentary tract with animal parasites. Cutaneous symptoms are chiefly confined to a vesicular, discrete, skin eruption, the hairs in spots becoming matted together with an amber-coloured sticky material. Anasarca and cachectic dropsy are not at all uncommon. Abscesses, and swellings along the lower surface of the abdomen may also be observed, probably arising from an irregular form of strangles, which is a very frequent complication in young equines.

II. *In Bovines.* The symptoms, course, duration, and prognosis are, on the whole, very similar in equines and bovines. Young animals, again, as in the former, particularly calves and yearlings, are the most frequent subjects. Lachrymation, nasal mucous discharge, salivation, and stomatitis are prominent features and more constant and severe in cattle than in horses. Fissures, erosions, and ulcerous patches are commonly found in the oral mucous membrane, usually on the inside borders of the lips, and on the gums. The teeth are often irregular, defectively developed, loosened and blackened, the temporary teeth not shed at the proper time. The jaws may be swollen, and the facial expression suggestive of that of a bull-dog, to borrow a simile of Dr. Warnock's. Tremors of the muscles of the head and neck, the head nodding more or less continuously either vertically or horizontally, are characteristic signs by which the disease is often recognized in range cattle, these symptoms being more accentuated when the animal is grazing, ruminating, or attempting to perform any purposeful act, than when at rest. Rigidity is common in the muscles of the head, neck and trunk; the back is arched, the neck twisted, and the jaws remain open or clenched in advanced cases, and then, as if endeavouring to counteract the cramp and rigidity the head and neck are fully extended, the act being prolonged for the space of several minutes, and always accompanied by severe muscular tremors.

For long periods, or persisting throughout the course of the disease, large joint swellings may be noted, involving the carpus, tarsus, and digits. These swellings are firm and slightly elastic to the touch, and on puncture are found to contain a viscid or mucoid, blood tinged fluid. Cutaneous desquamation is continuous and abundant, and the hide, as in most debilitated range animals, is infested with lice.

*Duration and Course in equines and bovines.*—In animals remaining on the range where the disease was acquired the course is a slow, chronic, steadily progressive one. Not one of the stockowners interviewed could relate in their experience a single case of acute intoxication from loco-poisoning, on the contrary, all agreed that the sickness comes on in a slow and undecided manner, sooner or later manifesting itself in a profound disturbance of the nervous system. Locoed animals, however, are very prone to intercurrent infections and parasitical invasions, and the disease becomes complicated















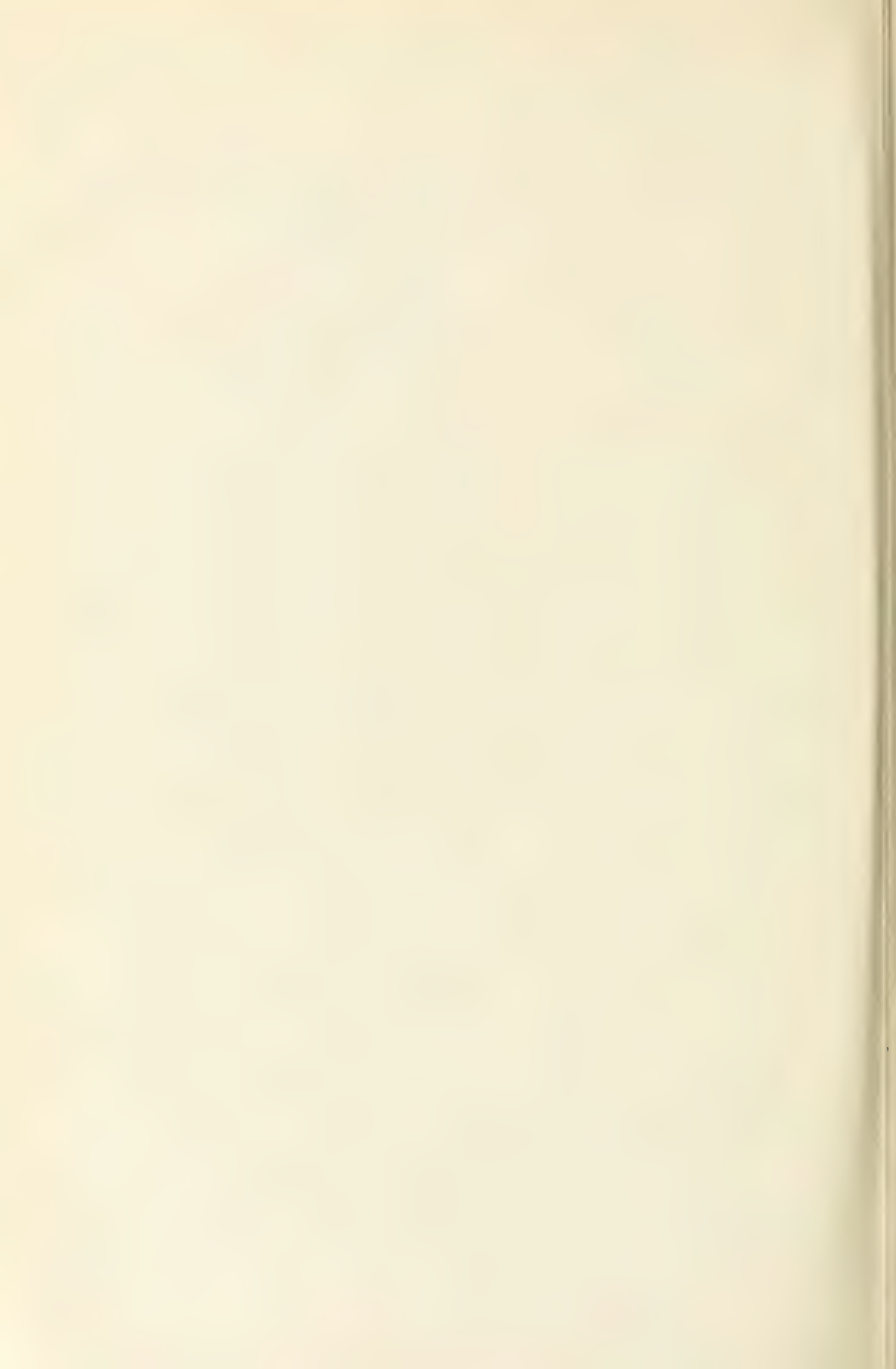




CHART V

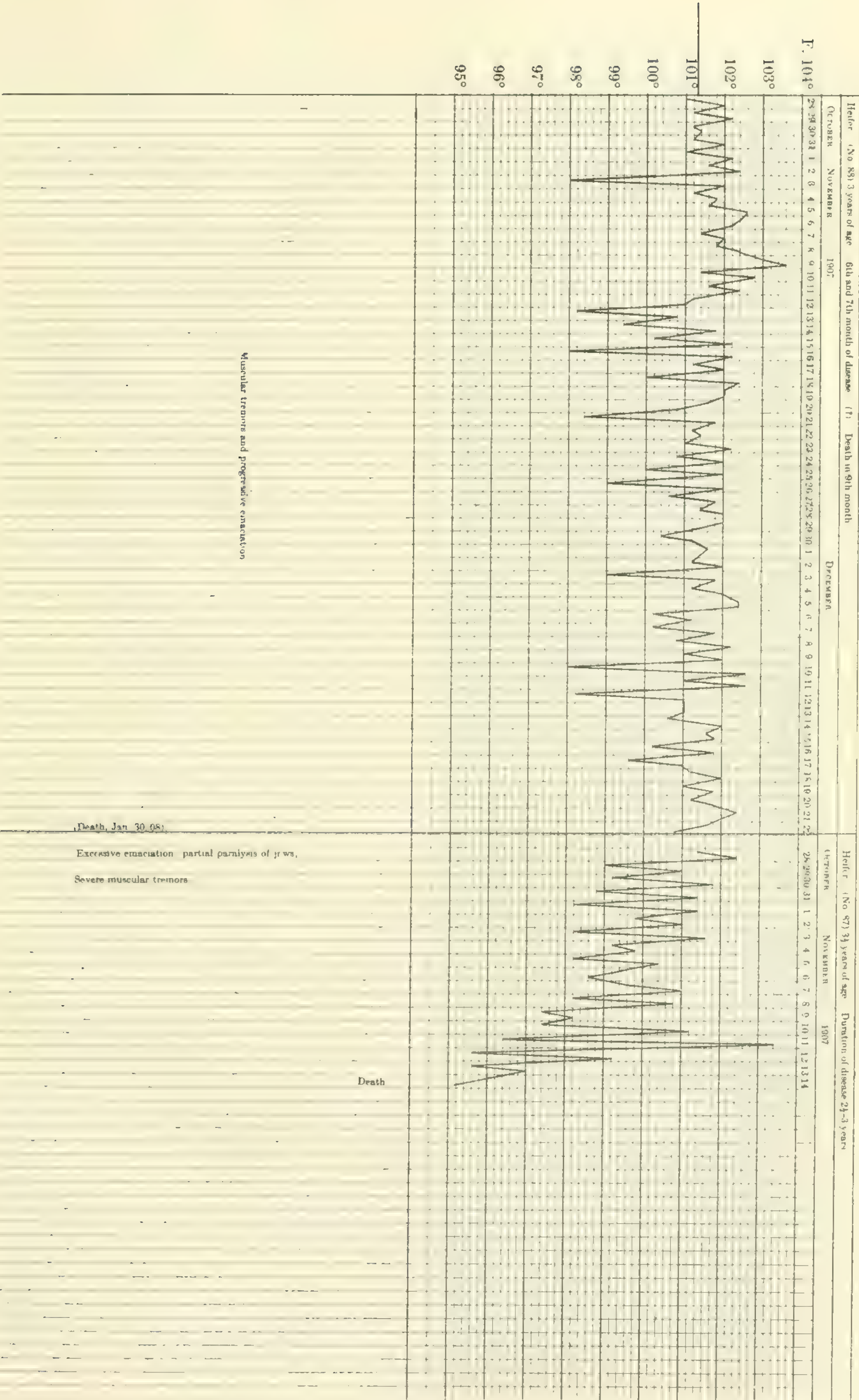
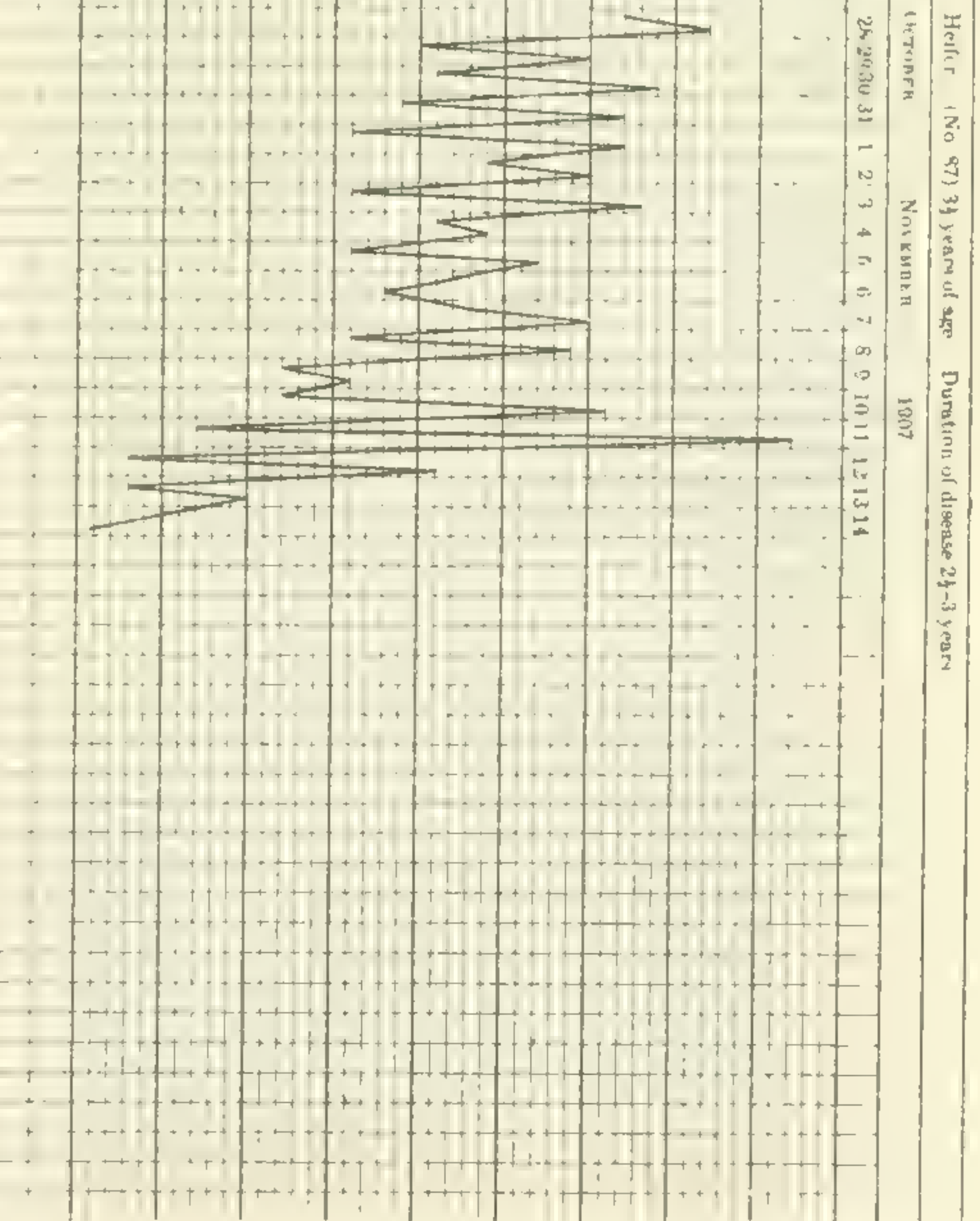


CHART VI









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by disorders of the digestive system due to animal parasites, circulatory disturbances due to verminous aneurisms, muscular psorospermiosis (sarcosporidiosis), distemper, etc. In the final months there is extreme emaciation, the utmost melancholia and stupor, and recurring attacks of paralysis. The duration of the malady is from six months to two years, or even longer. Certain stockowners stated that about 70% of their affected animals died within the first year of the disease, 20% of which succumbed within the first six months. Those living from two to three years have usually been removed from the range for certain periods, during which the symptoms have fluctuated or abated, but always reappearing in severe form shortly after returning the animals to their native pastures.

*Termination and Mortality.*—Recovery is a very rare event, and death the usual termination, occurring during one of the prolonged attacks of paralysis, or from slow starvation, but frequently from a terminal infection such as Purpura haemorrhagica, broncho-pneumonia, or peritonitis resulting from perforation of an intestinal ulcer. From statements already given it will be seen that the mortality is very heavy.

*Pathology.*—The bodies of those animals succumbing to loco disease are very emaciated. The lesions met with at autopsies are neither constant nor characteristic, and vary greatly according to the duration of the sickness, the complications, and the terminal infection. There is a sero-gelatinous infiltration of the subcutaneous and intermuscular tissues, and swellings of this nature are commonly found in the soft structures of the head, especially the eye-lids, cheeks, and muzzle.

*Mucous Membranes.*—The conjunctival are swollen, translucent, pink in colour, rarely petechial. The nasal is infiltrated, or congested, and in cases with purpuric complications intensely petechial and haemorrhagic. The oral may present erosions or ulcerous patches.

*Digestive organs.*—The literature on the pathological conditions in locoed animals contains many allusions to ulceration of the walls of the stomach and intestinal tract, and these lesions are generally regarded as due to the exciting cause and not as secondary conditions arising from the presence of animal parasites. In six autopsies held on locoed equines I found ulcers, nodules, verminous tumors, and areas of chronic inflammation, these lesions being in apparent proportion to the degree of parasitical infestation. In one case where only a few larvae of *gastrophilus equi* were found in the stomach, and a few *Sclerostoma* in the caecum and colon, three ulcers were observed in the mucous coat of the latter, none elsewhere. In a second case in which the stomach and duodenum were infested with thousands of larvae of *Gastrophilus*, the colon and caecum with innumerable sclerostomes encysted in every portion of the wall of the bowel, attached to the mucous membrane, and free in the very dry impacted contents, there was seen extensive ulceration throughout the alimentary tract, ulcers in all stages of development, many on the verge of perforation and one actually perforating the small intestine with an opening the size of a lead pencil. In a third case in which the presence of parasites and the degree of ulceration was similar to the preceding, and in addition, soft sub-mucous tumors and nodules in the stomach wall containing *Spiroptera*, there was an abscess in the spleen connecting with an ulcer perforating the stomach wall. The alimentary canal from the stomach to the rectum of two locoed heifers, proved free from ulcers or parasites visible to the naked eye. The peritoneal cavity contains an abundance of serous fluid; and, in most cases fibrinous filaments or tufts were adherent to the surfaces of the liver and spleen, and serous coverings of the bowels.

*The Liver.*—The liver is not enlarged but appears softer and browner in color than normal. Microscopical examinations of livers have not revealed an interstitial hepatitis, the characteristic condition of Pictou cattle disease. There was in all



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livers an excessive deposit of granular pigment matter, greenish-black or brown in colour, the cells loaded with the pigment or disintegrating, the nuclei staining very feebly.

*The Spleen* is not enlarged.

*The Heart and Blood Vessels.*—From 100-600 c.c. of fluid may be found in the pericardial sac, with more or less evidence of a chronic fibrinous pericarditis and subepicardial gelatinous infiltration. In one case the heart of a small mare weighed nine pounds, in the other animals the organ was not enlarged though sometimes softened. In cattle especially the myocardium is infested with *sarcosporidia*, these parasites also appearing in the endocardium as multitudinous white specks.

At every autopsy on loosed equines verminous aneurisms were found, *Strongylus armatus*, *Sclerostoma equinum*. In one case only one aneurism the size of a walnut was seen, but in the others the aneurisms were of a most formidable type, and present in numbers of six to fifteen. In two cases a mass of atheromatous vessels two to three times the size of a man's fist was met with, the aneurisms extending along the colic artery as far as the pelvic flexure. Some of the arterial dilations contained thrombi one inch in thickness and two to four inches in length. The arteries involved were, the great mesenteric in six, the coeliac trunk in three, the colic in two, the posterior aorta and renals in two, and probably the hepatic, splenic, and pancreatic in two cases.

*The Respiratory Organs.*—Pathological changes may be marked or absent. In one bovine the air passages were choked with a clear mucous, there was a quantity of pleuritic effusion, and serous infiltration of the lung tissues. In another, the air passages were choked with a semi-purulent fluid, and the lungs in a stage of chronic suppurative inflammation. In an equine the lungs were intensely congested; in another, mottled and haemorrhagic, and at four autopsies not found visibly altered.

*The Musculature.*—The flesh is poor in blood and has a brownish or greyish tinge, more pronounced in cattle than in horses. Minute white granules may be seen on cross-section of a muscle if carefully searched for, or thin white elongated coils and spirals on longitudinal section; these are sarcosporidian cysts, often present in vast numbers but not always possible to detect with the unaided eye. They may be found in the muscles of the head, neck, and extremities, but especially abundant in these of the tongue, gums, esophagus, and diaphragm, and in the myocardium. In very chronic, severe cases of loco-disease the whole of the muscular system was found to be completely overrun by these parasites. This phase of the disease has been separately dealt with in a report already submitted by me, entitled "Sarcosporidiosis".

*Osseous changes.*—These, when present, vary considerably in character and extent. The shafts of the long bones and plates of the flat bones may be greatly thinned. The swollen appearance of the face when not due to œdema or gelatinous swelling, is caused principally by enlargement of the alveolar cavities of the superior maxilla. The alveoli are distended upwards and outwards, causing flattening of the supraorbital foramen and pressure on the superior maxillary nerve where it emerges from this opening. The bony plates that form these enlargements may become so exceedingly thin that they may, in the dried skull, be easily broken through by pressure of the finger. In other cases however, the skeletal structure may be rather thickened or softened, or is found apparently unaltered.

*Joint Lesions.*—There is more or less articular inflammation. The capsule and synovial membrane are œdematous and swollen. The cartilage is softened and shows a pinkish discolouration. Large serous swellings of the joints are more often found in cattle than in horses.



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*Cerebro-Spinal Lesions.*—The cerebro-spinal fluid is yellowed and increased in quantity, and on microscopical examination exhibits a mononuclear leucocytosis. The fluid in the spinal canal is of a semi-gelatinous nature. Sero-sanguineous effusions between and beneath the coverings of the brain are usually to be seen. The grey matter is softened and has a pinkish discolouration, and the contrast between the grey and the white matters is not as sharp and clear as is the case in normal brain substance. In one case hæmorrhages beneath the pia, gelatinous œdema of the choroid plexus, and an enlarged pituitary body were noted. In another, that of a heifer, the brain presented a blackened surface with metallic lustre, the condition being due to a remarkable deposition of granular pigment distributed in and beneath the inner covering over the whole of the brain, most excessive over the anterior lobes of the cerebrum. On section the sulci were very deeply pencilled owing to the presence of the pigment granules.

## BLOOD EXAMINATIONS.

It is stated by some authors that the fundamental character of loco disease is a progressive anæmia. It would seem that the statement is based chiefly upon the blanched appearance of the mucous membranes that may be observed during life, and the pallor of the musculature and viscera at autopsies. In the literature on the subject I have been unable to refer to actual blood-counts and examinations, and in the few examinations made by me the expected condition was not revealed to any marked extent. Pallor of the tissues, it may be remembered, is not always a sign of a true anæmia and may be occasioned, as in all probability it is in loco disease, by cardiac insufficiency and similar causes, and not from actual loss or poverty of blood. In this disorder the total volume of blood, very difficult to estimate, does appear reduced, but the characteristic changes in anæmia, the deficiencies in quality and quantity of red cells per cubic millimetre are but very slightly apparent. In my examinations of the blood of locoed horses the count of the red cells gave from six to seven millions per cubic millimetre, and fifteen to twenty-two thousand white cells or leucocytes, (seven and a half millions of red cells and ten thousand white cells in healthy horses.) The hæmoglobin scale in locoed cattle and horses registered at between seventy and eighty. Several hundreds of stained blood smears were examined, the variations in size and shape differed, but not greatly, from those in normal blood, nucleated and stippled red cells were never met with. The differential leucocytic count denoted a predominance of the lymphocytes and mononuclear cells, except in the blood taken in the end-stages of the disease which then showed a marked polynuclear leucocytosis. The relative percentages may be seen in the table that follows:—

AVERAGE, RELATIVE PERCENTAGES.

	Locoed Cattle.	Healthy Cattle.	Locoed Horses.	Healthy Horses.
Polymorphonuclear neutrophiles . . . . .	10.7	20.5	38.0	54.2
Eosinophiles . . . . .	7.0	11.5	6.0	5.9
Mast cells . . . . .				1.5
{ Lymphocytes, large and small . . . . .	62.2	55.0	42.5	30.7
{ Large mononuclear . . . . .	17.8	10.5	11.0	5.1
{ Transitional . . . . .	2.3	3.0	2.5	2.6
	100.0	100.0	100.0	100.0



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The microscopical examination of the blood for the detection of some species of haematozoa has been carried out carefully and systematically, from day to day for periods of five to thirty days in six cases, and a single examination made in twenty-five cases. Also, the fluid in oedematous swellings, the extra-vascular fluids found in the large serous cavities of the body, and the cellular elements of the internal organs including the brain and spinal cord have been examined, and have failed to reveal the presence of a parasite or micro-organism as the chief exciting cause of the disease. The sarcosporidia were the only parasites detected that could bear a possible important relation to the symptoms observed in affected animals.

A fairly large number of inoculations (see Experimental Inoculations) of the blood and fluid of affected animals have been carried out in different species of healthy animals, without success in obtaining any positive results. These experiments do not conclusively prove that the disease is of a non-infectious character, but tend to show that it cannot be transmitted by direct inoculation of blood.

*Diagnosis* can be established in the majority of cases without much difficulty on cerebral symptoms, errors in judgment and vision, or, in the later stages, from the condition of dejection, misery, stupor, and malnutrition. The very chronic nature of loco disease will exclude those other more or less acute conditions arising from poisoning by water hemlock, larkspur, etc. In young equines the consequences of irregular and malignant forms of Strangles must be remembered, for these may simulate to a great extent some of the conditions found in loco disease, and probably are frequently confounded with them; Strangles, moreover, happens to be very prevalent and severe in the loco-affected district of the Porcupine Hills.

The term 'loco disease,' as already pointed out, is an embracive one, and may not rarely include those conditions known as Osteomalacia and Osteoporosis, and perhaps rightly so, for each of these maladies may be said to be one of locality, and each one in several important respects bears a close analogy to the other, and further, in the absence of positive knowledge and proof of the etiological factors concerned, a 'dietetic origin' has been given each one of them. However, there are certain phases in these diseases that are somewhat contradictory to the theory of the 'dietetic origin,' upon which much disfavour has been cast by several eminent investigators in its relation to equine osteoporosis, the contagious nature of which they appear to be convinced. Certainly, the 'big-head' is a valuable diagnostic sign in loco disease although, as revealed at post-mortem, the appearance is not always due to enlargement of the bones of the skull, or but partly and partly to a solid oedema.

Lastly, as Dourine (*Maladie du coit*) exists in Alberta in districts not far removed from or within the loco affected area, some difficulty may be experienced in differentiating between the diseases in equines. Certain of the ocular symptoms, the loss of equilibrium, cachexia, and emaciation are common to either disease. In entire horses swelling of the penile sheath, in mares a vaginal discharge, the vulva patent, the mucous membrane swollen and infiltrated, are conditions that may be encountered in locoed animals. In Dourine the inco-ordination is chiefly restricted to the hind quarters and extremities, which are depressed, drag, and knuckle over at the fetlocks, while in loco disease the peculiarity of the gait, consisting of the high stepping action and over-flexion but without knuckling, is principally noted in the front limbs, further, the muscles, joints, limbs, and back are more or less rigid, whereas in Dourine they are relaxed.

#### REMEDIAL AND PREVENTIVE MEASURES.

Very little can be advised in the way of medicinal treatment. If barium poisoning proves to be the cause of loco-weed disease, then as stated by the author of that theory, Dr. Crawford, the administration of sulphates, especially magnesium sulphate, is indicated. Chemical agents, however, could scarcely be of a permanent value unless



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the exciting cause has been determined and removed, treatment commenced in an early stage of the malady and continued and varied according to symptomatic requirements.

But if the spread of the disease among healthy animals on a range where the grass and fodder conditions appear excellent, can be accounted for by the loco-habit largely acquired by imitation, it is obvious that affected animals should at once be removed from the healthy to a range or pasture free from the obnoxious weeds. Healthy animals on the range could be placed in charge of a herder and kept separate from locoed animals. Instances are reported where affected cattle by early removal to a range free from loco plants, or taken in and hand-fed, have so far recovered as to be profitably slaughtered, though such animals are always stunted and undersized.

It may here be noted that the thirteen animals, seven equine and six bovine, collected in the Porcupine Hills district and sent to the Quarantine Station near Lethbridge, have not done well. All of these animals were sheltered, fed good prairie hay, four of the horses in addition receiving bran and oats. Two of the horses were given tonic and alterative treatment with arsenic, sodium bicarb., magnesium sulph., and sulphur. Notwithstanding, in the seven horses and two of the six cattle the disease progressed apparently unhindered, and terminated in death. Three of the cattle appear to be making a slow recovery.

### THIRTEEN CASES OF LOCO-DISEASE UNDER OBSERVATION AT THE QUARANTINE STATION, LETHBRIDGE, ALTA.

#### CHIEF POINTS OF INTEREST.

**CASE I.**—Heifer, (No. 87.) aged  $3\frac{1}{2}$  years, said to have shown symptoms when a yearling, moderating in the winter months under good feeding and stabling, and recurring in the spring when turned out to pasture. Oct. 27, '07. Very poor body nutrition. Rough and staring coat. Cutaneous desquamation. Hair matted with branny scales and a glue-like material. Back arched, jaws rigid, and tremors of muscles of head and neck. Prehension and mastication very imperfect. Great depression. The heifer was in an advanced stage of the disease, was stabled and fed hay, bran and oats, but ate little and could scarcely be aroused from the intense stupor. Nov. 14, '07. Death. Duration of the disease,  $2\frac{1}{2}$ -3 years.

*Autopsy.*—Serogelatinous infiltration of subcutis, intermuscular and connective tissues. An excessive deposit of blackish, granular pigment in the coverings and on the surface of the brain. Musculature infested with sarcosporidia. Broncho-pneumonia as a terminal infection.

**CASE II.**—Heifer, (No. 88.), aged 3 years. Symptoms not quite as severe as but approaching those in Case I; and also, lachrymation and a watery nasal discharge. The disease advanced without remission and for a week before death the animal was in the extremity of helplessness. Jan. 30, '08. Death. Duration of disease, 9 months, possibly 1 year and 9 months.

*Autopsy.*—Peri and epicarditis, fibrinous. Sero-fibrinous exudates in the larger body cavities. The entire musculature overrun with sarcosporidia. Chronic, suppurative inflammation of the lungs.

**CASE III.**—Steer, (No. 83), aged 3 years.

Oct. 27, '07. Symptoms similar to but less marked than in the preceding.

Oct. 27, '08. Symptoms have rather fluctuated but are now quite if not more severe than they were a year ago. The body is undersized and poorly developed, the head relatively large and shapeless. Muscular tremors are very pronounced when the



animal is feeding, drinking, or licking salt. The performance of rumination can rarely be observed. The expression and habits are dull and apathetic. Recovery is improbable.

Case IV. (No. 84) Steer, aged 2 years.

Case V. (No. 85) Heifer, aged 3 years.

Case VI. (No. 86) Heifer, aged 2 years.

On October 27 '07, these animals showed mild loco symptoms, alternately dull and excitable; nutrition was defective, growth and development poor. The condition remained unaltered during the winter following, but in the past summer they have improved and are now, October 27. '08, though undersized, in very fair flesh and appearance and loco symptoms are scarcely discernible.

Case VII.—Filly, Clydesdale (No. 89), aged 2½ years. Was loco-affected when a yearling, 1906. Was stall-fed during the winter of '06-07, and had greatly improved when turned out to pasture in the following spring, the disease recurring in severe form in July '07.

October 28 '07. Excessive emaciation. Intense depression, the head carried very low or supported against side of corral or fence post. Overflexion of arms and thighs and some loss of equilibrium. Head relatively large, the superior maxillary bones enlarged, lips and eye-lids swollen, the lower eye-lid everted, translucent film over cornea.

Visual errors, poor appetite, the mouth constantly found packed with food, severe constipation.

November 15. '07. Coma and paralysis lasting 4-5 hours.

December 8 '07. Coma and paralysis ending in death.

Duration of disease, 1½ years.

*Autopsy.*—Alimentary canal infested with animal parasites, larvae of *Gastrophilus*, *Spiroptera* and *Sclerostoma*; verminous tumours and ulcers in the stomach and intestinal walls. Formidable verminous aneurisms of the coeliac trunk and great mesenteric artery. Large amount of light yellow fluid in the pericardial sac and peritoneal cavity. Ovarian cysts the size of hazelnuts and walnuts. Brain-matter greatly softened. The alveoli in the upper jaw enlarged, and portions of the superior maxilla reduced to the thinness of paper.

Case VIII. Gelding, (No. 90) aged 2½ years. Was loco-affected when a yearling, 1906. Symptoms, October 28, '07, very similar to case VII. The animal rapidly failed, became excessively emaciated and in the final week or two could walk only a few yards.

December 10, '07. Death. Duration of disease 1½ years.

*Autopsy.*—*Sclerostoma* encysted in walls of colon and caecum. Gelatinous infiltration of epicardium and auricular myocardium; 300 c.c. of pericardial fluid. A great mass of verminous aneurisms and fibrous thrombi in the coeliac trunk, great mesenteric and branching arteries. Splenic abscess. Cerebrospinal fluid abundant and discoloured; sero-sanguineous effusion between the brain and coverings, the brain matter pinkish grey and softened.

Case IX. Gelding (No. 91), aged 3 years. Was affected when a yearling. Symptoms, October 28, '07, similar to case VII, maniacal periods, vertigo and muscular twitchings being very common. Subsequently these attacks become less and less frequent and finally ceased giving place to intense depression and semi-coma. From January-May, '08, the body was excessively emaciated, the habits and expression extremely melancholic, and paralytic attacks not infrequent. On several occasions the animal lay stretched on the ground for 12-18 hours, the pulse imperceptible, the temperature



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95 degrees F. or lower, giving scarcely a sign of life and would finally return to consciousness and regain its usual condition.

May 12, '08. Death, at the end of a paralytic attack lasting 36 hours.

Duration of disease 2 years.

*Autopsy.*—Alimentary canal infested with animal parasites, the bowels impacted with dry, undigested matter, the mucous membrane presenting extensive ulceration and nodular or tumour formations. Gelatinous infiltration of the subcutis, connective tissues and epicardium. Oedema of the genitalia. Musculature infested with sarcosporidia. (Circumstances prevented the examination of the brain and spinal cord.)

CASE X. Filly, (No. 92) aged  $2\frac{1}{2}$  years. Was affected as a yearling. October 28, 1907. Malnutrition, cutaneous desquamation, vesicular skin eruption; poor appetite and constipation. Depression was the usual condition, mania or vertigo were not observed to occur naturally but could be easily induced by purposely exciting the animal. The limbs would be overflexed and the gait had the characteristic high-stepping action. The head was relatively large, the muzzle much swollen and with little function of prehension.

This animal was given a course of arsenical treatment, the drug being administered in a powder with sodium chloride, sodium bicarb. and sulphur, and mixed in a feed of bran and oats. Drenches of linseed oil and turpentine were also given. No improvement was apparent, emaciation became more and more excessive and death took place on January 25, 1908. Duration of disease  $1\frac{1}{2}$  years.

*Autopsy.*—The intestinal tract was severely ulcerated, but animal parasites with the exception of a few *Gastrophilus* larvae had been eliminated, a few sclerostomes remained in the caecum. Verminous aneurisms in the great mesenteric and colic arteries. A large ulcer perforated the small intestine, and the abdomen contained a great quantity of brownish, blood-tinged fluid. The lungs were intensely congested, liver soft and friable, the surface of the spleen petechial. The muscles were very pale and contained sarcospores. Extravasations of fluid in the cranium and spinal canal, the brain substance softened and discoloured.

CASE XI. Gelding, (No. 93), aged  $3\frac{1}{2}$  years. Was affected when a yearling. October 28, 1907. Symptoms not as severe but of a similar character to case X. A similar course of treatment was given as in the preceding, and with no better result. The animal lived for many months in an extremely emaciated and miserable condition, succumbing during a prolonged attack of paralysis on June 16, 1908.

At autopsy only the musculature was examined and this was found infested with sarcosporidia. Duration of disease 2 years.

CASE XII. Mare, (No. 94), aged 12 years. Said to have been a very gentle work animal until May, 1907, when she began to exhibit the nervous symptoms of loco and soon became quite unmanageable. October 28, 1907. Emaciation commencing, depression and stupor alternating with vertigo, usually quiet unless handled. The mare failed rapidly and muscular inco-ordination became apparent.

December 10, 1907, paralytic attack.

December 18, 1907, symptoms of purpura haemorrhagica; a bluish film spreading over cornea of left eye.

December 26, 1907, death. Duration of disease about 7 months.

*Autopsy.*—The characteristic appearances of purpura haemorrhagica. Gelatinous infiltration of the myocardium, 600 c.c of fluid in the pericardial sac, and a great quantity in the abdomen. Adhesions of organized lymph to the peritoneum and surfaces of liver and spleen. The heart weighed nine pounds. The liver contained a few calcareous nodules. Large masses of verminous aneurisms involved the arteries branching from the post aorta. Haemorrhages under the pia, gelatinous oedema of the choroid plexus, dark, pinkish discolouration of the brain substance.



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CASE XIII Foal, (No. 95), aged 8 months, of mare in case XII. October 28, 1907. Loss of appetite, depression, stiffened gait, swollen face and lips, poor nutrition. November 28, 1907, paralytic attack, and again on December 4, 6, and 7. Death December 8. Duration of disease about 6 months. The feature of the autopsy was the immense verminous aneurisms, larger and more formidable than in any of the preceding cases.

#### *Inoculation Experiments.*

(1) Filly, aged 2½ years, received subcutaneously 30 c.c. of defibrinated blood of heifer No. 87.

(2) Mare, aged 5 years, received intravenously 180 c.c. of defibrinated blood of gelding No. 90.

(3) Filly, aged 2½ years, received subcutaneously 180 c.c. of citrated blood of gelding No. 90.

(4, 5 and 6) Mice, each receiving intraperitoneally 1 c.c. of citrated blood of mare No. 89.

(7 and 8) Mice, intraperitoneally, 1 c.c. of epicardial fluid of gelding No. 90.

(9 and 10) Mice, 1 c.c. of cerebrospinal fluid of gelding No. 90.

(11 and 12) Mice, 1 c.c. of brain emulsion of gelding No. 90.

(13 and 14) Rabbits, intraperitoneally, 30 c.c. of defibrinated blood of gelding No. 90.

(15) Puppy, received an intramuscular injection of 30 c.c. of citrated blood of No. 90.

No visible reactions followed the inoculations in equines, rabbits, and the puppy. The mice in expts. No. 7 and 11 died in nine and six days, respectively. The ascitic fluid in these animals contained immense numbers of micro-cocci, further inoculations of which produced a rapid form of septicoemia and death in one to two days; the microbe doubtless being a contamination of the material inoculated. Thus, in these limited experiments, the disease was not transmitted.

*Contact experiments* have likewise failed.—A healthy cow and calf were placed in a shed with two locoed cattle every night for four months, and for nearly a year have been pastured with four locoed cattle, and have not contracted the malady.

Similarly, healthy horses have been stabled and pastured with locoed horses, with negative result. There are loco weeds in abundance in these pastures but no evidence of the disease, or that the loco-habit has been transmitted to or acquired by any of the Quarantine Station animals.

#### *Temperature Charts.*

The temperatures recorded in the accompanying charts, I to VI, were taken, it will be seen, in a late or final stage of the disease, and during a period when depression, or stupor and emaciation were the prevailing symptoms, and when the animals could be easily handled. An attempt to obtain a temperature record during an earlier stage of the malady had to be abandoned owing to the great difficulty in controlling animals when symptoms of mania and vertigo are uppermost. Taking the normal temperature as 100.4° F. with a daily fluctuation of about 1° (which proves to be the usual average in healthy horses at this station) in equines, and as 101.4 in bovines, the records in charts I—IV appear considerably below normal. The daily fluctuations are very irregular and frequently cover 4°, occasionally 6° and over.

The pulse beats in locoed equines are usually soft, slow and irregular frequently under 30 and rarely over 40 per minute.

#### *Explanation of Photographs.*

1. Animal No. 91, April 26, 1908. In the final stages. Depression, misery and emaciation.



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2. Animal No. 92, November 25, 1907. In the final stages. Depression, misery and emaciation.
3. Animal No. 93, December 8, 1907. Six months before death. Facial distortion.
4. October 27, 1908. Locoed animals on arrival at Quarantine Station.
5. Animal No. 92, December 6, 1907. Facial swellings.
6. Animal No. 89, December 6, 1907. Facial swellings.
7. Animal No. 94, December 18, 1907. Facial swellings, purpura haemorrhagica.
8. Animal No. 89, November 25, 1907. Great depression.
9. Animal No. 91, October 27, 1907. Stupor alternated with vertigo, locomotion uncertain, sometimes ataxic.
10. Animal No. 94, December 18, 1907. The same as in No. 7.
11. Animal No. 91, December 18, 1907. Vertigo, stupidity, enlargement of the head.
12. Range steer, September 18, 1908. Exhibited mania, vertigo and visual errors, could not be driven and staggered over a cut-bank falling into the creek below, where the photo was taken.
13. Range Steer September 18, 1908. Exhibited muscular tremors, depression and abnormal gait.
14. Range Steer, September 18, 1908. Exhibited muscular tremors, depression and abnormal gait.
15. Range Steer, September 18, 1908. Exhibited muscular tremors, depression and abnormal gait.
16. Animal No. 83, December 6, 1907. Similar to preceding and facial deformities.
17. Animal No. 84, December 6, 1907. Similar to preceding and facial deformities.



## APPENDIX No. 11.

(E. A. WATSON, V.S.)

LETHBRIDGE, ALBERTA, March 31, 1909.

SIR,—I have the honour to submit the following brief note in reference, more or less, to:—

*THE LIFE HISTORY OF TRYPANOSOMA EQUIPERDUM.*

The original strain of *T. equiperdum*, obtained by me in February, 1907, from a mare clinically affected with Dourine, has been maintained to date by a number of passages through equines, and the periodicity of trypanosomes in the blood or fluids of typical lesions occurring in the experimentally infected animals continues. This has enabled me to secure a fairly large collection of specimens of the parasite in different stages of development and to study the morphology of the trypanosome as it occurs in its natural host, one of the equidae. Several observers have called attention to the difficulty of studying the parasite under these conditions owing to its long periods of absence from, and its paucity in numbers when present in the blood or body fluids of the horse, and to the desirability of doing this whenever possible as the existing descriptions of the parasite are mostly taken from its appearance in the blood of infected laboratory animals, in which, it is said, the cyclical development of the trypanosome and the course of the disease differs from that occurring in the horse. My study is still incomplete but will be submitted, I hope, with other records of this investigation at the end of next March. In this brief note I chiefly desire to call your attention to some recent views regarding the life-history of trypanosomes in general and of *T. equiperdum* in particular, and a consideration of these views in their applicability to the occurrence of Dourine in Canada or to the experiments in connection with that disease being carried on at this station.

In The Huxley Lecture on 'Recent Advances in Science and their bearing on Medicine and Surgery' delivered by Sir Patrick Manson, on October 1, 1908, (Jour. Trop. Med. and Hygiene, Vol. XI, No. 22, and 'The Lancet,' October 3, 1908), there is advanced the hypothetical law that—

'blood-haunting protozoa having arthropod vectors require, and make use of, these vectors for necessary sexual developments,

and the statement that if the law thus formulated applies to this

'trypanosome (of sleeping sickness) or any trypanosome for that matter, it applies to all trypanosomes; . . . .'

and,

' . . . .that the argument founded on the direct communicability of dourine in the apparent absence of an insect intermediary for its germ *T. equiperdum* is not valid;

Manson. 'Believing . . . . in the necessity for sexual reinvigoration in all animals, including the protozoa; and believing that a sexual stage occurs in the case of other trypanosomes, I believe it must occur in that of dourine *T. equiperdum*, and . . . . that it is passed in some insect as yet unrecognized. . . . some apterous, hemipterous, or semi-parasitic insect phylogenetically allied to the tsetse flies is its intermediary. This insect has not been found, probably because it has not been looked for in the proper way.'



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The foregoing will no doubt be subjected to much criticism and the argument against Manson's law, founded on the direct natural transmission of dourine, maintained until more is known concerning the life-history of the pathogenic trypanosomes. Salvin-Moore, Breinl and Hindle, (Annals of Tropical Medicine and Parasitology, Vol. II, No. 3, Page 199), in 'The life-history of *T. Lewisi*,' and previous to the publication of Manson's address, state that the trypanosome of dourine—

'under normal and natural conditions is not transmitted by any fly, or biting animal, but simply through contact. It was clear, therefore, that in this instance we had a trypanosome life-history which is not normally complicated by the passage of the parasite through any intermediate host. Whatever life cycle *T. equiperdum* may possess, this cycle must be completed, and can be studied in the body of a single host.'

The direct transmission of the parasite of dourine from infected to healthy equines, by subcutaneous or submucosal inoculation, has, in my hands, been successful in producing in every case, and after varying periods of incubation ranging from a few days to several months, trypanosome infection and exceedingly chronic though typical but mild symptoms of dourine. The duration of the infection in these experimental equines ranges from a few months to two years and has terminated fatally only in one case, namely, a foal, which succumbed in the 5th month of the disease. The other animals have maintained a very fair general health and condition save during the paroxysms, which have occurred but rarely and are usually of short duration, the periods between them, of intermission or latency, very prolonged. The mare from which this present strain of trypanosome was first obtained, is now in the 30th month of the disease, the last observation of trypanosomes in the blood or body fluids was made during a paroxysm occurring in the 13th month after infection, but the mare has never regained proper muscular co-ordination and is in a very poorly nourished condition. To go back still further, the stallion that infected this mare succumbed to dourine in the 21st or 22nd month of the disease. These observations do not furnish any evidence that this strain of *T. equiperdum*, after successive passages through equines, has increased in or even maintained its virulence, but rather an indication that it has suffered some loss, although it is as yet too early to make any definite statement as to the latter. There may be taken into consideration the fact that while equine inoculations have all been successful in producing a trypanosomatic, though as yet not very fatal infection, inoculations in laboratory animals, contrary to the experience of other workers with tropical strains of *T. equiperdum*, have proved futile. My attempts to transmit the infection to dogs, young and old, cats, rabbits, mice and white rats have failed. The strain of *T. equiperdum* used by Salvin-Moore and Breinl was a very virulent one, 'after injection no parasites appear until about the third day. They then multiply with extreme rapidity, and kill the animal in about four days after their first appearance in the blood.' The inability of the trypanosome to infect rats and other susceptible laboratory animals then, together with the abnormally delayed or mild results of infection in equines, may be considered as an indication of a loss in virulence. It will be a matter of great importance to ascertain in what way further passages of this trypanosome through equines affect its virulence. The failure of transmission to small animals, while it does delay and hinder progress in the work in some respects and prevents the opportunity of carrying out certain studies and experiments, may not ultimately prove of great disadvantage as whatever work and experiment has been done here has been directly in connection with the parasite and its natural host, the horse, and the results, though more limited, so far as they go, are more or less positive and definite and not subject to the problematical conditions, requirements and conclusions attending artificial trypanosomatic infection, the duration and cure of, immunity and prevention from, in laboratory animals.

If Manson's hypothesis should prove to be correct, and the insect intermediary necessary for the sexual reinvigoration and, therefore, virulence, of the trypanosome,



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exists only in the tropics, it would afford a possible explanation of the comparative mildness of the dourine infections in Canada, and a hope that the trypanosome causing it will eventually become non-pathogenic, even for equines—the trypanosome, after numerous direct passages through equines, gradually losing its sexual reproductive faculty, especially in native breeds of horses and horses raised in this country, resulting in prolonged periods of latency, or the dying out of the infection and recovery.

I hope to maintain the virus with which I am now experimenting until more certain knowledge has been obtained on the questions outlined in the foregoing. Dourine, as we see it, is so exceedingly chronic, frequently obscured, and often difficult to diagnose that progress in this investigation is necessarily slow and conclusions can only be arrived at with great caution.

I have the honour to be, Sir,

Your obedient servant,

E. A. WATSON,

*In charge of Quarantine Station.*

To The Veterinary Director General,  
Ottawa.



## APPENDIX No. 12.

## A CONTRIBUTION ON SARCOSPORIDIOSIS.

*With especial reference to its associations with 'Loco' disease and Dourine, and the possibility of mistaking the spores of Sarcocystis for certain so-called developmental forms of trypanosomata, by E. A. Watson, V.S.*

Although Sarcosporidiae are of common occurrence in the musculature of domesticated animals, very little is known concerning the life-history of the parasites, and nothing but supposition as to the means by which their hosts become infected. Further, a marked uncertainty or contradiction exists as to the power these parasites possess in producing a serious and recognizable disease.

It would appear that in the majority of cases of infection, in otherwise healthy animals, the invasion is a very limited and harmless one, involving to a more or less slight extent the muscles of the œsophagus and tongue, but that in certain conditions, generally of obscure origin, and briefly designated under the term 'cachetic,' the parasites may overrun the entire muscular system and become a grave menace to the life of their hosts.

A brief resumé of the more important observations on the subject by various authors is here given:—

## NOMENCLATURE.

- (a) Muscular Psorospermiosis.
- (b) The sarcoysts, tubes, sacs or utricles of Miescher.
- (c) Rainey's corpuscles (the spores of the cysts).
- (d) Sarcosporidiosis.

It is stated in Neumann's Parasites,<sup>1</sup> that about 40 per cent of pigs may be infected. Moulé, quoted by the same authority, found the parasites in 98 per cent of cachetic sheep, usually numerous in proportion as the cachexia is more accentuated. In 100 sheep in good condition he met with them in 44, and then always in small numbers. Of 100 oxen condemned for being in extremely bad condition he found 37 infected with Sarcosporidiae. In cattle in good condition he found them only in three instances.

Schulze noted their presence in the muscles of the forehead of a horse, destroyed on account of paralysis of the anterior limbs. Some similar examples are also recorded by Neumann. The following extracts are quoted from Minchin's<sup>2</sup> account of the Sarcosporidiae:—

'In acute cases all the skeletal muscles may be infected, even those of the head . . . . the parasite grows until it distends the fibre to five or even ten times its normal breadth, absorbing the contractile substance as it does so. . . . The cysts are observed to degenerate in some cases, their adventitious walls becoming calcified, in other cases the cysts burst and spread their contents in the surrounding tissues, destroying the muscles and producing tumours and abscesses.

'The symptoms of Sarcosporidiosis in the pig are paralysis of the hinder extremities, a skin eruption, and general symptoms of sickness, such as thirst, increased body-temperature, and dim, streaming eyes.

'The disease is sometimes the cause of fatal epizootics among domestic animals, especially sheep. In the mouse also Sarcocystis muris is a very deadly



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parasite. Laveran and Mesnil have isolated the toxine of the Sarcosporidian parasite of the sheep, and named it Sarcocystine, a substance found to be extremely toxic for the experimental rabbit.'

From some feeding experiments by Smith and others, quoted by Minchin it seems extremely probable that infection naturally occurs through the digestive tract. Sarcosporidia have rarely been found in man; a few cases of fatal infection are mentioned by Neumann, and others by Bulloch.<sup>3</sup>

Ostertag<sup>4</sup> does not consider the eating of flesh of infected animals dangerous to man. Neumann again thinks that infected meat should be prohibited for human use 'because of its bad appearance and diminished nutritive value.' According to the same author 'muscular Psorospermiosis is not betrayed during life by any appreciable signs and the parasites can be detected only at autopsy.'

The following cases have come under the writer's personal observation:—

(a) *In Cattle Suspected of Loco-poisoning.*

CASE I.—(animal No. 27) heifer, 3 years old; said to have developed symptoms of loco-poisoning as a yearling.—(Dr. Hilton.) Received at quarantine station October 27, 1907; stunted, undersized appearance, and in poor flesh; coat staring and rough, on passing the hand over the body numerous small scurfy nodules could be felt, knots of hair matted with moist, bran-like scales. There were frequent prolonged extensions of the head and neck, accompanied by a more or less constant trembling and agitation of the muscles of these parts, especially of the jaws, and most marked during attempts at feeding, the power of the prehension of food being practically lost, and mastication very difficult and incomplete. Death occurred November 14, 1907.

*Principal features of Autopsy.*—Gelatinous infiltration, light yellow to an orange colour, of the connective tissues, lungs and kidneys. The inner covering of the brain, the pia, very dark, almost black in places, and of a metallic lustre. The heart enlarged, appearing soft and flabby, yet proving tough on section. The endocardium sprinkled with minute whitish granules, very numerous.

*Microscopical.*—Heart and its endocardium very extensively infested with Sarcosporidia. Unfortunately, by the time these preparations had been examined and the parasites recognized, the carcass had been disposed of, and none of the skeletal muscles preserved. There was an immense deposition of greenish brown pigment granules in the covering of the brain and the cells of the cortex.

CASE II.—Heifer (animal No. 88). The symptoms and condition being so similar to Case I., they need not be further described, beyond adding that there was a thin watery discharge from the nostrils, dimmed eyes, and occasional lachrymation. After being under observation for three months, in which the disease made steady progress, until the animal became quite helpless, she was destroyed.

*Principal lesions at autopsy.*—Fibrinous inflammation of epicardium. Minute whitish specks showing through endocardium. The heart as a whole too voluminous.

*Lungs.*—Chronic, suppurative inflammation. Small sacks or cysts, about the size of a bean or small nut, and rather resembling lymph nodes, could be squeezed from the cut surface of the parenchyma. The appearance of the skeletal musculature slightly granular, cloudy and light brownish-red colour. The brain in this case did not reveal any abnormalities visible to the eye. The molar teeth were very irregular and badly developed, and the bones of jaws and face thin and brittle, though rather enlarged.

*Microscopical.*—The following muscles, organs or tissues were examined for Sarcosporidia. (1) Psoas, (2) diaphragm, (3) tongue, (4) larynx, (5) upper and lower lips, (6) the gums, (7) the jaws, masseter and buccal, (8) the muscles of the poll, splenis and complexus, (9) of the eye, (10) of the limbs, the adductor magnus, flexor



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pedis perforatus, flexor metacarpi externus, (11) the heart, (12) the liver, (13) spleen, (14) kidneys, (15) lungs. In every specimen of every muscle examined, the parasites were exceedingly numerous; Plate I., figs. 1 and 2, representing the degree of invasion. In the lungs the semi-purulent cysts consisted of leucocytes and disintegrating cellular tissues; a few Sarcospores in process of decay were seen. It is extremely probable, but not proved, that these inflammatory areas in the lungs resulted from the presence and disintegration of Sarcocysts. In the spleen, liver and kidneys, a very few degenerating spores were seen and much granular pigment matter.

The myocardium contained very numerous parasites. While, as already stated, all of the skeletal muscles were extensively invaded, those of the head, poll and extremities were, if anything, the more heavily infested.

CASE III.—(Animal No. 83) Steer, 3 years old. Similar condition to preceding cases, but the disease not so far advanced. During the past three months, in which the animal had been hand-fed and well cared for, the symptoms have increased in severity. Depression is deepening, muscular action stiff and slow. Jaws swollen. The animal was cast and a small fragment of muscular tissue excised from the tongue, Flexor Metacarpi Externus, the masseter, and one of the cervical muscles. Sarcospores were found in preparations of each, not as numerous as in cases I. and II., but still fairly plentiful. The present condition of the animal leaves little chance for recovery.

CASES IV., V. and VI.—(Animals 84, 85 and 86.) Steer and two heifers, two, three and two years old respectively. The condition is approximately the same in each, namely, slow, sluggish muscular action, depression, and a dejected, unthrifty appearance. These animals were cast and operated on as in Case III. The muscles examined and the results as follows:—

Case IV.—Masseter—Sarcosporidia numerous.

Upper cervical—Sarcosporidia fairly numerous.

Tongue—Sarcosporidia fairly numerous.

Case V.—Flexor metacarpi externus—Sarcosporidia not found.

Middle cervical—Sarcosporidia fairly numerous.

Tongue—Sarcosporidia very numerous.

Case VI.—Lower cervical—Sarcosporidia numerous.

Tongue—Sarcosporidia numerous.

Thus in all muscles examined, with the single exception of a very small fragment of the flexor metacarpi, Sarcosporidia were present.

(b) *In the Equines Suspected of Loco-poisoning.*

CASE VII.—(Animal No. 91.) Gelding, rising 3 years old showing symptoms of loco-poisoning as a yearling.—(Dr. Hilton.)

The condition, briefly, on admittance to the quarantine station, October 27, 1907, depression, restlessness; slowly wandering about without aim or object. Slow, high, hesitating gait, as if walking over obstacles. When undisturbed, the head is carried very low, down to the level of the knees, the neck often twisted. When suddenly startled, there is a brief period of excitement and the animal may stagger and fall. At present date, after a period of five months, the condition has become greatly aggravated, and it does not look possible for the animal to live much longer. Flexion and extension of the limbs are extreme, and brought about very slowly, and it is quite impossible for the animal to run, trot or move out of a slow walk. The bones of the face appear much swollen, and the expression truly melancholic and pitiable. Small sections of the tongue and masseter muscle were removed and Sarcocysts were found in micro-sections of each. The parasites were few in number, and small, though containing spores.



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CASE VIII.—(Animal No. 93.) Gelding, rising 3 years old, also showing symptoms of loco-poisoning as a yearling. On October 27, 1907, the condition was very fair, symptoms only slightly noticeable; but during the past five months the disease has greatly advanced until the present condition is quite as bad as the preceding case. A fragment of the flexor maticarpi externus muscle only has been examined. Sarcocysts were present, few in number, and in a young stage of growth. Previous to the finding of Sarcosporidiae in any of the foregoing cases, five loco-diseased equines had succumbed. The parasites not being suspected none of the skeletal muscles were microscopically examined. A portion of the myocardium was preserved in each case, in which no parasites were detected. A section of the tongue of one of these animals had been preserved, and in this Sarcosporidian cysts were found.

(c) *In Dourine-affected Equines.*

CASE IX.—(Filly, 9 months old). Experimentally infected with *Trypanosoma Equiperdum*. In the fluid of a cutaneous swelling that followed the inoculation free spores of Sarcocysts together with trypanosomata were found, each species of parasite being present in about equal numbers.

CASE X.—(Filly, 2 years old.) Inoculated with the blood of a Dourined stallion. Seven months later, in the fluid of a cutaneous swelling, free Sarcospores were present, mostly crescentic forms, and indistinguishable from the crescents described by certain authors (see Plate II.) as developmental forms of Trypanosomata. Trypanosomes were not seen in this animal at this time.

CASE XI.—(Mare, 3 years old), in final stages of naturally acquired Dourine. Sarcospores were found free in the fluid of a swelling on two occasions, the swellings resulting from some serum-injection experiments.

(d) *In a Cachetic Filly, the Cause of the Cachexia Not Known.*

CASE XII.—(Filly, 2 years old), one of six supposedly healthy fillies shipped to quarantine station for experimental work. It was noted on arrival, that this animal (No. 68) had an unthrifty appearance, stiffened gait, rough hide and was in poor flesh. The mucous membranes were pale. She was several times carefully examined for signs of Dourine, but none were detected. The cachexia became more evident during the autumn and winter, with increasing stiffness of the muscle and gait, especially of the hinder extremities. The animal was found dead in the pasture on March 4th last, the body frozen.

The muscles of the œsophagus, tongue and extensors of the fore-arm were infested with Sarcosporidiae. They were not seen in the myocardium or the muscle of the eye; none other were examined.

In cases I. to VIII. of Sarcosporidiosis in 'locoed' animals certain symptoms and conditions are described. These are more or less characteristic of 'loco-disease.' This disease itself is now under investigation at this station and will be the subject of a separate and later report, and is only mentioned here in those respects in which it may bear a possible relation to Sarcosporidiosis, or where the writer is unable to differentiate between the symptoms of the one and the other. Certainly, a great variety of conditions and symptoms occur in the course of the malady or maladies attributed to loco-poisoning. There appear various forms of mental derangement, from mania in the first stages to a dense stupor or comatose condition in the latter; disorders of the muscular system from increased reflexes to spasms, atrophy and paralysis; osseous enlargement or degeneration, especially of the jaws and parts of the skull; impaired vision; depravity, emaciation, etc. The history in most cases shows that the disease is very chronic, and often of a fluctuating or intermittent character. The muscles of the head and neck, especially of the jaws, the lips, and the



PLATE I.

Fig. 1.

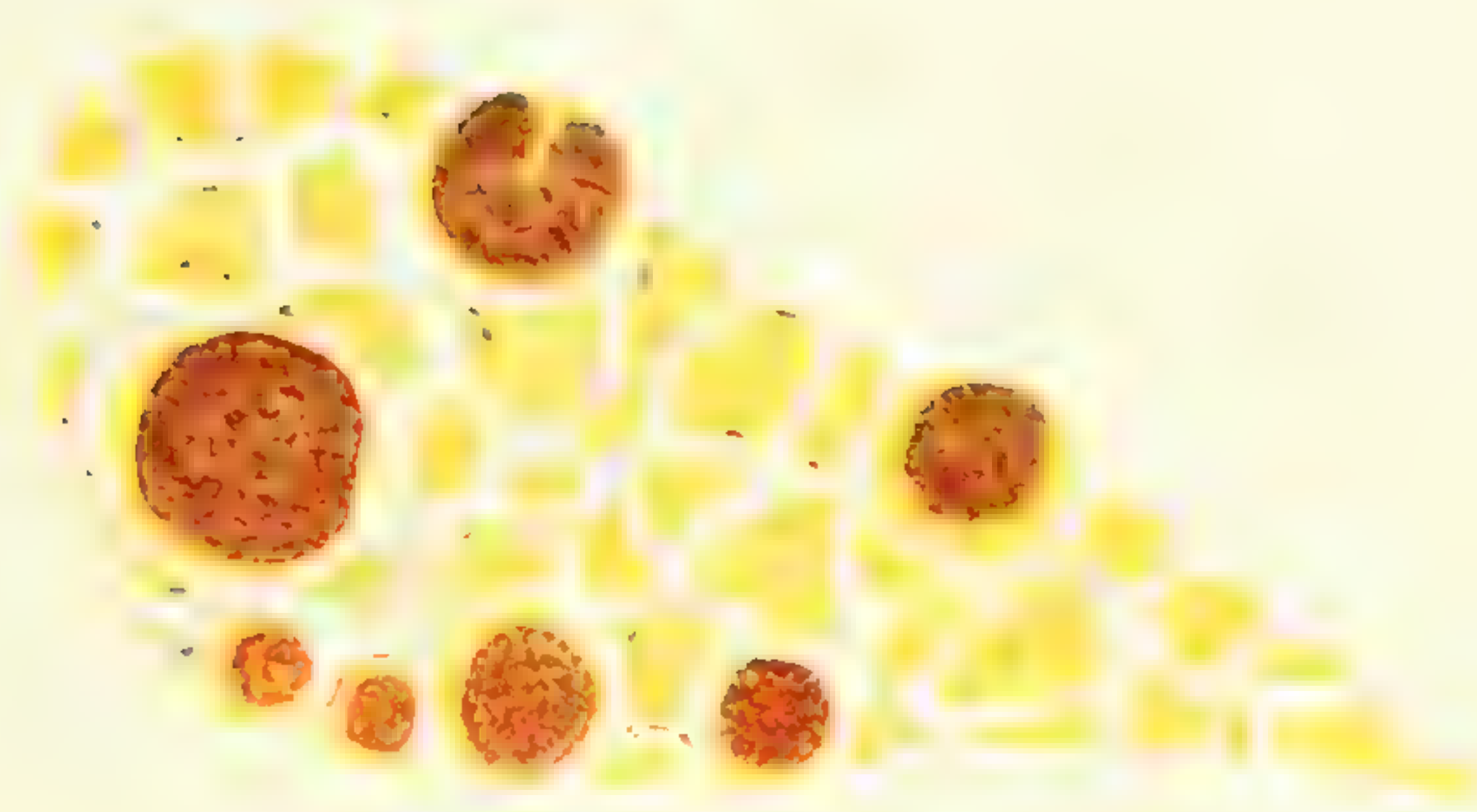
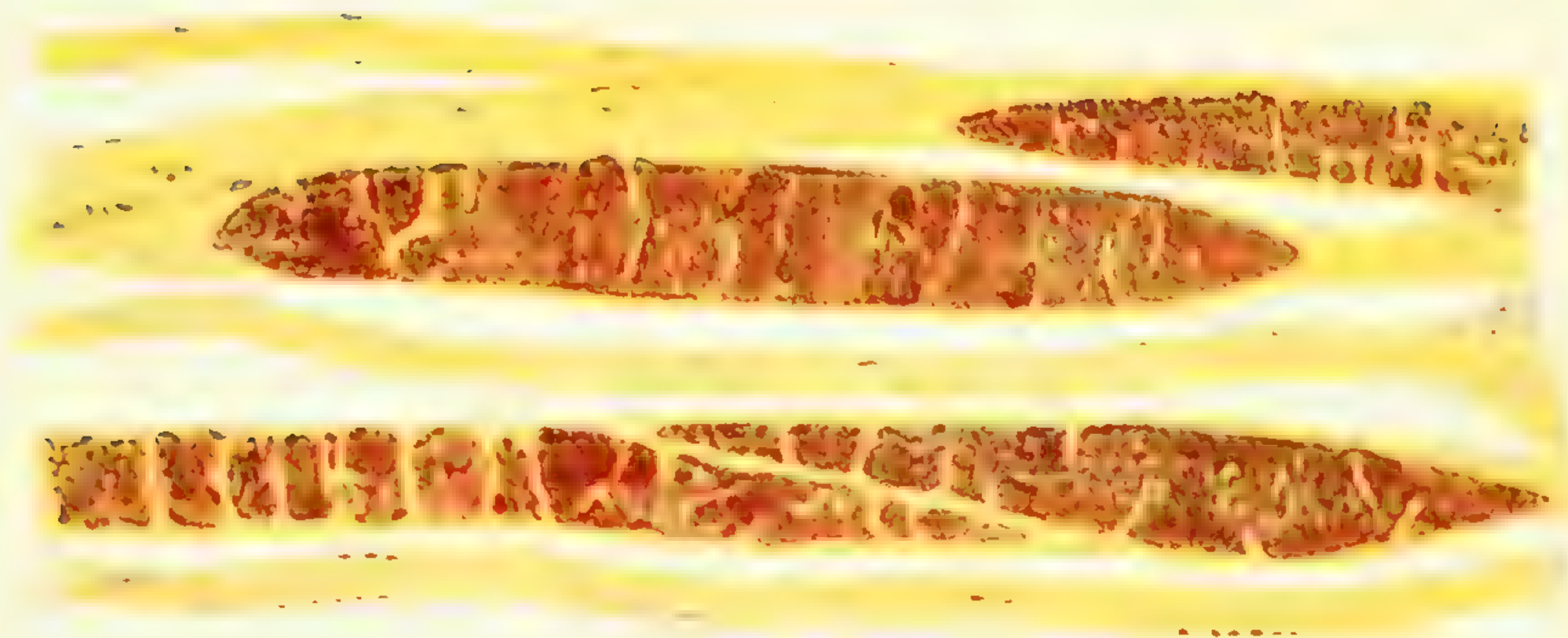


Fig. 2.



Gd. S. H. E.A.W.

Fig. 3.





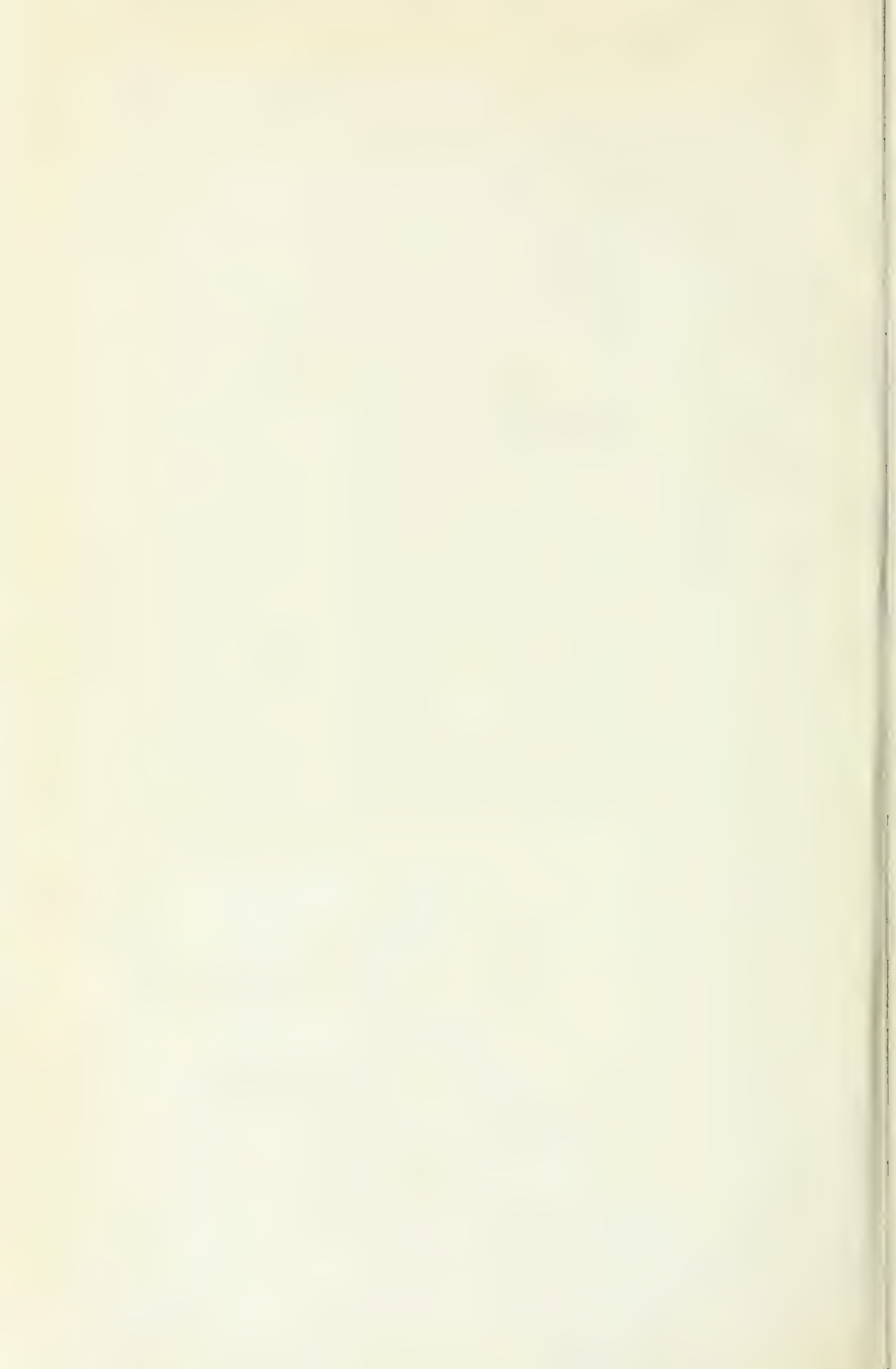




PLATE II.

Fig. 1.

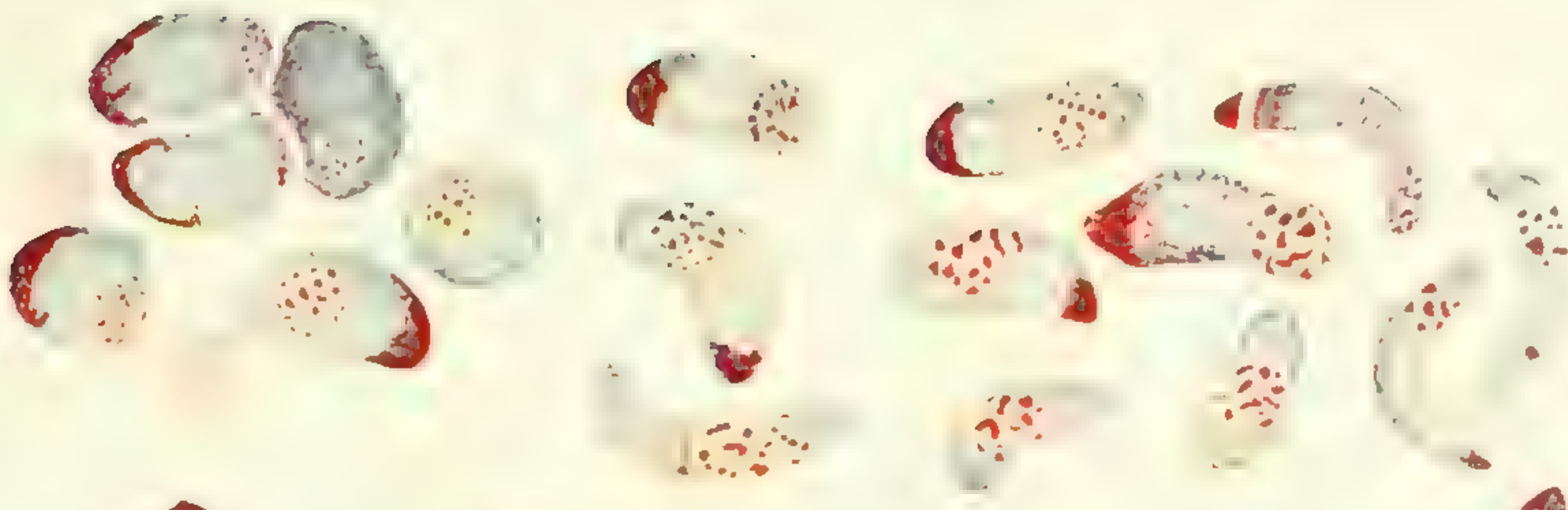


Fig. 2.



Fig. 3.



Fig. 4.

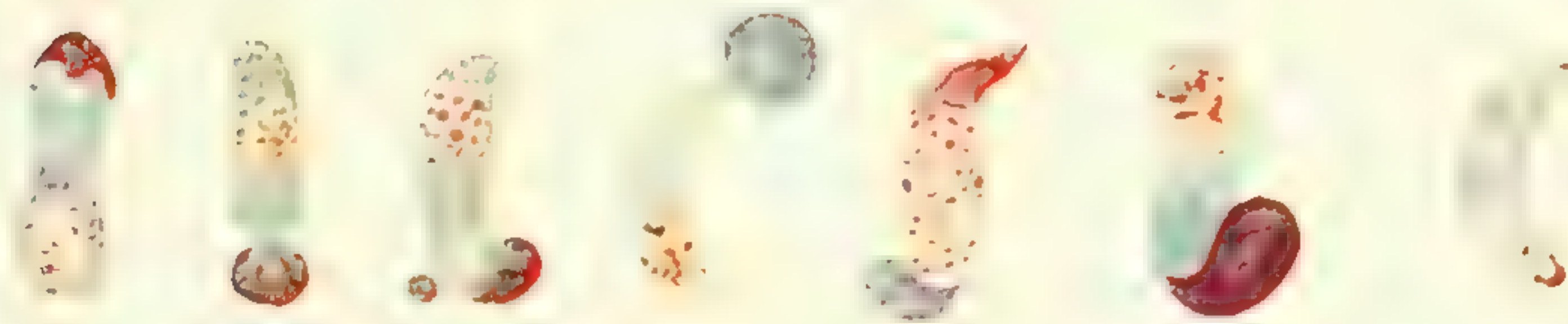
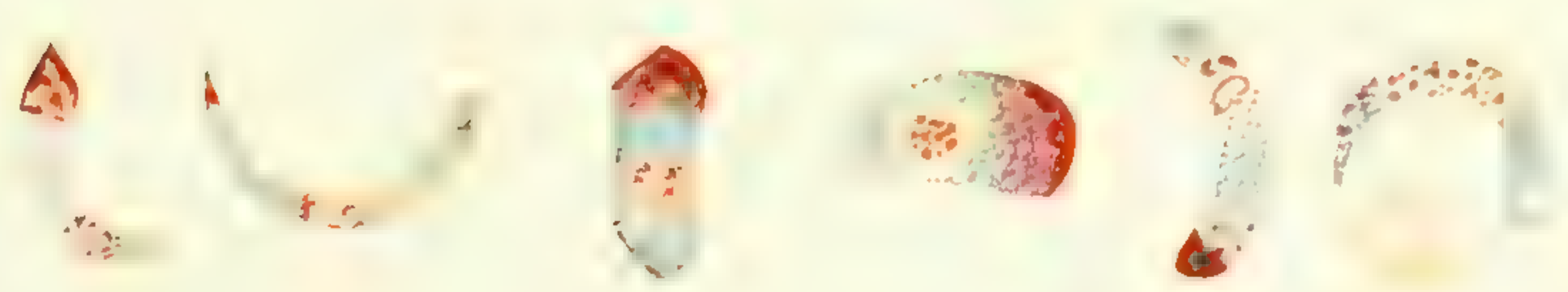
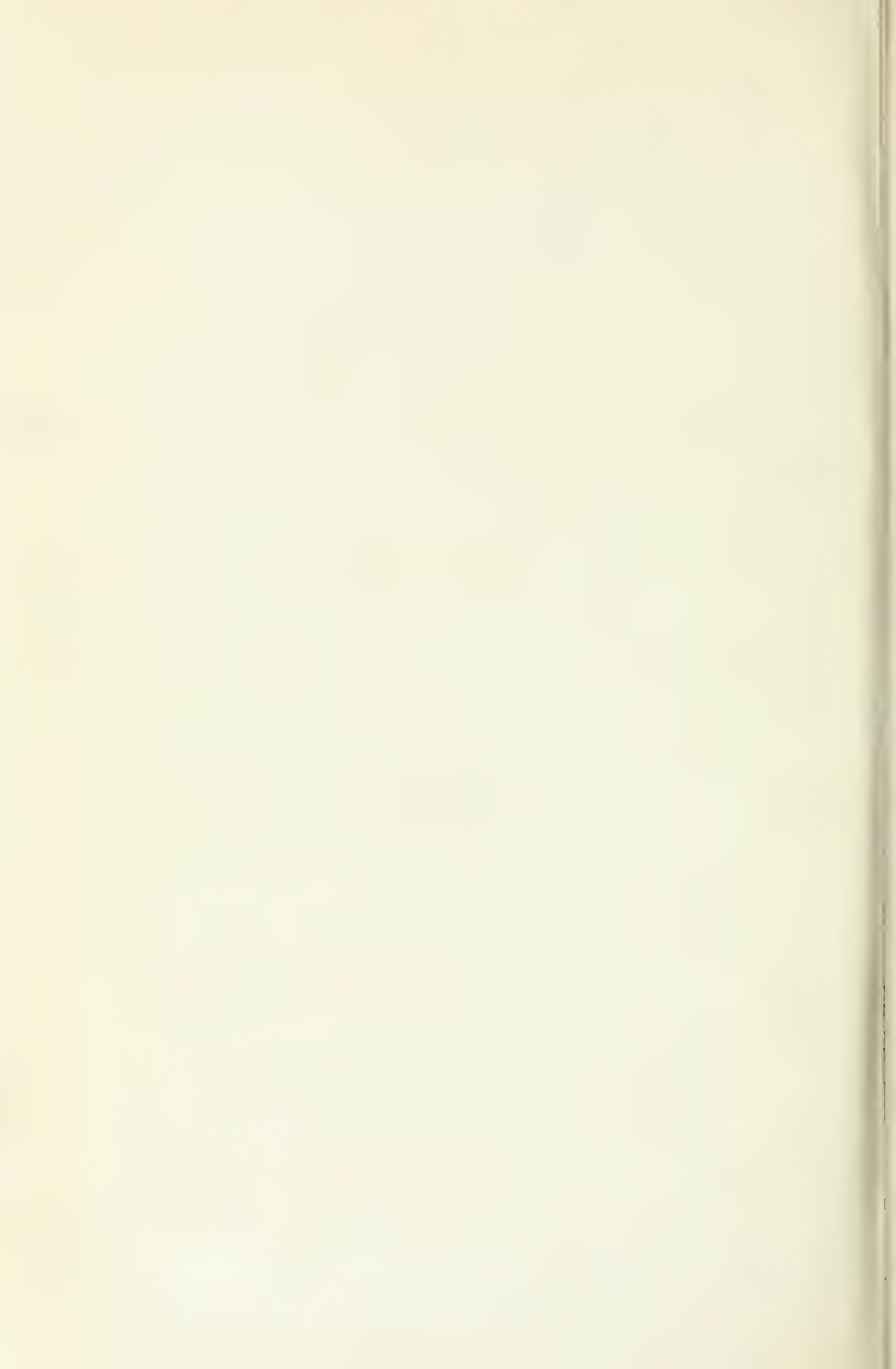


Fig. 5.









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tongue exhibit tremors, spasmodic contractions or prolonged after-contractions. The jaws sometimes remain rigid, the head and neck extended. In equines cramps are not infrequent, a limb is slowly extended as far as possible, remaining in that position for a short time, then slowly and extremely flexed, held high above the ground for a minute or more, the animal moving off at a limp. The contractility of the muscles is delayed, slow, and hesitating, not arrested at the proper moment, resulting in over-flexion and extension. This might be explained by absorption of, pressure on, or breaks in the continuity of the protoplasm of the muscle fibres by the Sarcocysts, and consequently, a greatly reduced conductivity. It is equally true, that the origin of this muscular disturbance may be seated in the nerve cells of the brain, as a result of loco-poisoning. If the latter hypothesis is correct, it is a strange coincidence that in the few cases examined the muscles most affected were those in which the parasites were most numerous. It is difficult to trace any relationship between the disease of the osseous structures of the jaws and face and the disease of the muscles; and yet, as mentioned before, Laveran and Mesnil isolated an extremely active poison from the Sarcocystis-tenella of the sheep (unfortunately, the original publication by these savants is not at hand) and it is permissible to assume that a similar toxine is elaborated by the parasites infesting the ox and horse. Sarcosporidiæ appear more numerous in 'locoed' oxen than in horses; in the latter intestinal parasites are exceedingly plentiful, and very formidable-looking verminous aneurisms have been found at each autopsy. The condition favourable to these parasitic invasions may very likely originate from ingestion of the loco-weed; and possibly to some other dietetic conditions peculiar to the ranges where loco-disease prevails. It might be mentioned in passing that the writer has on several occasions examined specimens of meat, purchased from a local butcher, for Sarcosporidiæ. In all, three ox-hearts, an ox-tongue, and several joints of beef have been examined, each specimen being from a different animal. Of these only one was found infected with Sarcosporidiæ, a heart, the parasites being very numerous. This heart looked decidedly unhealthy. There were a few fibrinous growths on the epicardium, considerable gelatinous œdema, and the little fat remaining, very soft and yellow.

*Concerning the Parasite, Sarcocystis.*

Class—Sporozoa; sub-class—Neosporidæ; Order—Sarcosporidiæ; Genus—Sarcocystis, Ray Lankester. (After Minchin.) Infecting domestic animals there are probably several distinct species of Sarcocystis, but these have not been clearly differentiated.

In those infections of the horse and ox, already described, and even in the most heavily infested cases, very young forms of parasites could never be found; only the trophic phase was met with, accompanied by spore-production, as in all of the sub-class of Neosporidiæ. In cattle the youngest trophozoites observed were lodged in the muscle fibre, and, though macroscopically invisible, had attained a considerable size and formed several hundred spores. The larger parasites, distending the muscle fibres, are just visible to the naked eye as minute whitish rods or specks. In the equines, Cases VII. and VIII., the parasites averaged a much smaller size than in the bovines, the smaller trophozoites containing only the spore mother-cells or pansporoblasts, preliminary to sporulation. In these young forms the radially striated enveloping membrane is well marked (Plate I., fig. 3); as the parasite matures the membrane becomes thinner and the striations disappear, until, in the largest forms as seen in cattle, the parasite appears to be held only by the sarcolemma of the muscle fibre. Evidently the parasites are able to multiply within the body of their host until every part of the muscular system is invaded; this endogenous mode of infection is hypothetically brought about by rupture of the cysts and dissemination of the spores, and yet, if this is actually the case it is strange that even in such severely infected cases



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as I. and II., no intermediate forms between the relatively minute spore and large young trophozoite could be found.

The spores themselves, the clamydospores, vary considerably in shape, size, and in the arrangement of their chromatin and polar capsule. In form they appear in all gradations from a perfect sphere to an oval, bean-shaped or crescent form, though each type is symmetrical and doubtless represents different stages in the development of the spore-cell. The spherical forms would appear to be the younger and the crescentic the older, as in each trophozoite containing many spores, some are found disintegrating and these are almost invariably of a crescentic variety.

The chromatin granules of the nucleus of the spherical spore are relatively small and scattered, and the polar capsule is granular and only partially developed; in the next stages, the chromatin collects into small bodies, and one end of the cell becomes pointed, and at this end is always found the polar capsule. This capsule stains with difficulty with most dyes, and not at all with the ordinary basic stains; even with some of the Romanowsky preparations only a faint pink ectoplast at one end of the spore, and where the protoplasm has receded, denotes the position of the capsule (see Plate II., fig. 3, No. 6). The Romanowsky stains, however, are preferable to any other, and, properly prepared, differentiate very clearly and beautifully the structures of the cell. A single granule, staining black, and, more rarely a double granule, may occasionally be seen, situated about half-way between the nucleus and the pointed extremity; this is doubtless the centrosome. (Plate II., fig. 7—the end spore, fig. 3, Nos. 1 and 6). In the older spores the nuclear chromatin collects into round or irregular bodies, eight to sixteen in number. The frequent finding of a large spherical spore and a crescent lying intimately, and in some cases apparently fused together is suggestive that the former is the female cell and the latter the male gamete (Plate II., fig. 3, No. 5). A large spherical form, probably resulting from the fusion of these two elements, may be seen dividing directly into two, three or four. (Plate II., figs. 2 and 3).

The possibility of mistaking the spores of *Sarcocystis* for developmental forms of *Trypanosomata*.

From time to time mention is made by various workers, of large 'crescentic bodies' or 'vermicule-like forms' occurring in the blood of animals affected with trypanosomiasis, and are generally described as developmental stages in the life-history of a species of trypanosomata.

Holmes,<sup>5</sup> in an article entitled 'Trypanosomiasis among cattle in India,' states, 'In the blood taken from two infected bulls I found peculiar developing forms bearing a striking resemblance to the crescents of human tertian fever. These are large crescent-shaped bodies staining blue and containing numerous chromatin granules.' Some of these forms of trypanosomata (?) are illustrated by author.

Lingard<sup>6</sup> in 'Species of trypanosomata observed in Bovines in India' mentions the above observations of Holmes, and further describes similar forms met with by him (Lingard), also illustrating them in coloured plates (Plate II., fig., 20, and Plate III., fig. 7, *Journal Tropical Vet. Science*, Vol. II., No. 7, 1907), stating 'These crescent forms, above described, are frequently co-existent with the piroplasma bigeminum or the smaller forms in the blood of Indian cattle. Possibly the presence of the crescents in Queensland bovines may point to the fact that these animals in some instances are also the host of a large form of trypanosoma, which up to the present has not been demonstrated in their blood.' Hunt, quoted by Minchin (page 269) and also by Lingard, 'found crescents in the blood of cattle, and observed their change into a spheriodical shape, but while comparing these bodies to the crescents of malarial parasites, he at the same time regards them as a form of sporulating body, producing spores endogenously.' Martin<sup>7</sup> in criticizing the observations of Holmes states,



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'Raymond also afterwards found them (*i.e.* the crescents) in the cattle of Bengal, and he is inclined to the opinion that they have nothing to do either with trypanosomiasis or piroplasmosis, but that they are really Sarcosporidia.' The writer ventures to express a similar opinion. At first, in finding them in the cutaneous swelling of Dourine-affected equines, side by side with mature and unmistakable trypanosomes, and after a careful comparison with the illustrations and descriptions furnished by Holmes and Lingard already referred to, and to which they appeared identical, he was inclined to consider them as developmental forms of trypanosomata. But subsequently, when positively no difference could be detected between these forms and certain of the spores of Sarcocystis isolated from cases I. to VIII. and case XII., he (the writer) became convinced that they belong to the latter genus of a parasite, and excludes any relationship between these crescents and trypanosomata. Certainly, such forms of the spores of Sarcocystis as are here depicted, Plate II., fig. 5, Nos. 2 and 6 and some others, may very easily be mistaken for trypanosomes in which the flagella and undulating membrane have been cast off, for 'stumpy,' swollen forms. It is of great importance, therefore, in diagnosing such a serious infection as Trypanosomiasis from blood specimens to remember the possibility of the presence of Sarcosporidia and their likeness to questionable forms of trypanosomata.

*Conclusions.*

1. The parasite Sarcocystis under certain conditions becomes a very important factor in disease, invading the entire musculature of their hosts, with serious or fatal consequences.

2. Sarcosporidiosis may be closely associated with, and is probably a very frequent sequel to, the disease of horses and cattle known as 'Loco-disease.' It may complicate the diagnosis of this disease, and also of Dourine, and probably of some others, and retard or prevent recovery from these and similar cachectic conditions.

3. The crescentic spores of Sarcocystis bear a striking resemblance to 'Crescentic-bodies' that have been described as developmental forms of trypanosomata, and it would be unsafe, or quite erroneous to diagnose an infection by the latter from the presence alone of those crescentic bodies.

4. The Sarcosporidia are deserving of more detail study and investigation than has hitherto been accorded them, both from a zoological and a pathological standpoint.

*Explanation of Plates.*

## PLATE I.

Fig. 1.—Cross-section of bundle of muscle fibres infected with Sarcocysts (from splenius muscle of heifer, Case II., hæmatoxylin and picric acid. Leitz objective No. 3 Ocular No. 3.

Fig. 2.—Longitudinal section of the same.

Fig. 3.—Young parasites showing radially striated envelope, and pansporoblasts from flexor metacarpi externus muscle of a horse, Case III. Objective No. 6, Ocular No. 3.

## PLATE II.

Showing the spores of Sarcocystis,  $\frac{1}{2}$  oil immersion, ocular No. 3.

Fig. 1.—Variations in size, shape nuclear arrangement, and formation of polar capsule.

Fig. 2.—Nos. 1-4, and fig. 3, Nos. 1-3. Dividing forms. Note the centrosomes in fig. 3, No. 1.

Fig. 3. No. 5.—Gametes or Zygote formation (?).



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Fig. 3. No. 6.—An example of spores more lightly stained, and showing only the position of the polar capsule.

Fi. 4. Nos. 1-6.—Constriction of the protoplasm, and extended bodies (?), No. 4, suggesting that the pointed extremity of the crescent spore had penetrated one of these bodies.

Fig. 1-4.—Are taken from Sarcosporidiae of the ox.

Fig. 5.—Represents types of spores found free in the fluid of cutaneous swellings in Dourine-affected equines.

All figures in Plate II. are stained by the writer's modification of the Romanowsky method, prepared as follows:—A polychrome blue is made by one per cent solution of medicinal methylene blue in a one-half per cent aqueous solution of sodium bicarbonate, heating and evaporating to dryness over a water bath. The residue is powdered and two solutions then prepared—

A.—35 ccm. B. 4 ccm. in 16 ccm. of methyl alcohol.

B. 0.5 per cent eosin in methyl alcohol and mixed in the following proportions:—

A.—35 ccm. B. 4 ccm. in 16 ccm. of methyl alcohol.

This solution is slightly alkaline (very useful for some purposes) for the study of Hematozoa and Sarcosporidiae. A drop or two of an exceedingly dilute solution of acetic acid in alcohol should be added, care being taken not to over neutralize, and the stain applied as in Leishmann's and other alcoholic Romanowsky stains.

The proportions of A and B may be varied slightly increasing the amount of eosin according to the reaction desired, and the stain may also be further diluted with methyl alcohol to advantage.

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## APPENDIX No. 13.

## RED WATER INVESTIGATIONS IN BRITISH COLUMBIA.

by THOMAS BOWHILL, F.R.C.V.S., F.R.P.S.

VANCOUVER, B.C. March 31st. 1909.

*Interim Report, July 14th, 1908, on the prevalence of Red Water amongst cattle in the districts adjoining the International Boundary in British Columbia and the State of Washington, U.S.A.*

Dr. Hutchinson, acting under instructions from his Government, requested me to show him some cases, if possible, of the Red-Water disease prevailing amongst cattle on this side of the International Boundary. Dr. Hutchinson was particularly anxious to compare the conditions present here with those on the other side of the line. I consulted Dr. Tolmie, and there being no official objection to the request, we left for the Mount Lehman District, on the 9th. of July. In that district, we visited the farms of Mr. White, Mr. Phillips, Mr. Morrison and Mr. Taylor. In all of those places we found typical cases of Red-Water; a very interesting case was found in a young bull. I examined the blood of all the cases and was able to demonstrate to Dr. Hutchinson the presence of the parasite previously described in my former reports; the most parasites were observed in the bull's blood. We also visited Peardonville, close to the Boundary, and Mr. Peardon informed us that he had no cases at present; he also stated that he could find no ticks on his cattle and has not seen any since last fall, when I obtained some off one of his cows; this animal died this spring from Red-Water. No ticks could be found on any of the other cattle examined, but were declared to be plentiful on rabbits and squirrels. On the 12th. of July I accompanied Dr. Hutchinson to the State of Washington, in order to observe the disease prevalent in that area. We went by rail to Blaine, and from there we drove to Lynden; en route we heard of many cases, and in many instances the loss has compelled the farmer to quit keeping cows. On the 13th of July, we visited the Ferndale, and Custer districts, lying west of Lynden. In those regions we saw several typical cases clinically indistinguishable from those observed in British Columbia; blood specimens were obtained from all of the cases examined. All of these sick cattle had been purchased a few days previous to our arrival by the Washington State Veterinarian, for the Experimental Station at Pullman. I was also informed that the farmers in the Ferndale district had recently, at a meeting held in that district complained of the loss sustained by this disease. No further information being obtained in this area we returned to Lynden, and left the same day for Sumas. At Clearbrook and about 1½ miles from the International Boundary a typical case was found—blood preparations were made. The farmers living between Sumas and Lynden all admitted the existence of a great many cases. The disease also appears to extend from Lynden, down the Nooksack River, almost to Bellingham. No ticks were found on any of the cattle examined, but rabbits and squirrels were reported to be infested, especially the rabbit. In my previous reports regarding the ticks I found at Mr. Peardon's farm I stated that they probably belonged to the genus *Rhipicephalus*, but since then I have been considerably perplexed regarding the exact determination of the species.

This spring I obtained a different variety of ticks from a squirrel at Mount Lehman. In order to get a reliable identification of the species these ticks belong to.



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I forwarded them to Professor Neumann, Toulouse, France; he replied that the tick I took off the cow since dead of Red-Water at Mr. Peardon's was a *Dermacentor Reticulatus*, Fab. and that the tick taken off the squirrel was an *Iyodes* which the Professor believes is a new species.

I may state, that in the blood of the squirrel, I have seen intra and extra-corporeal parasites while in the chipmunk, I have observed parasites also, but the latter resemble a spirochaete or intermediary stage between the piroplasmata and a trypanosome. These observations will be fully dealt with in my final report at present being prepared. The Genus *Dermacentor*, as well as the *Ixodus* have many hosts and it is a peculiar circumstance, that men like Mr. Peardon, and others who saw the ticks on the cattle last fall, have not been able to find even the larval form this spring. It appears to me that the cattle are most likely infected in the fall of the year. A further interesting feature bearing on this matter is the fact that the eggs ovi-positied this spring by the *Dermacentor Ret.* Fab. I obtained at Mr. Peardon's have not yet hatched out—of course the female may not have been impregnated. The disease is much more extensive in the State of Washington, than heretofore recorded.

Respectfully submitted,

THOS. BOWHILL, F.R.C.V.S., F.R.P.S.

The Veterinary Director General,  
Ottawa.

VANCOUVER, B.C., March 31, 1909.

SIR,—I have the honour herewith to forward for your information my third report on the investigations I have undertaken with the disease amongst cattle in this province known as Red Water.

The data, etc., dealing with the infected areas, pathology, parasites, etc., have been considered in my previous reports, while the parasites, etc., observed in other animals in the infected areas are at present dealt with.

I have also included some observations regarding flies, an equine disease and hog cholera.

The most important results are those of the experimental inoculations embodied in the accompanying charts. The conclusion based on the result of my investigation, is that inoculation of young stock in the infected areas is the best means that can be adopted for the eradication of this scourge on infected farms, as the loss is at present so great that many contemplate disposing of their dairy stock.

In carrying out these investigations, I have worked at a great disadvantage, owing to local conditions, difficulty in procuring fully fed ticks, etc. Mr. W. Kinninmonth, caretaker at the station, has done his work to my entire satisfaction and assisted in many directions.

I have the honour to be,

Sir,

Your obedient servant,

THOS. BOWHILL, F.R.C.V.S., F.R.P.S.

The Veterinary Director General,  
Ottawa.



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## LIST OF ILLUSTRATIONS.

- Fig. 1. The Phillips cow.  
 " 2. The Taylor cow.  
 " 3. Parasites in squirrel's blood, Mount Lehman.  
 " 4. Parasites in deer's blood, Langley.  
 " 5. Bladder of the Taylor cow, showing fibro-papillomatous growths and petechial spots on the mucosa.  
 " 6. Section of fibro-papillomatous nodule x 50.  
 " 7. Section of fibro-papillomatous nodule showing zoocoe of cocci x 800.  
 " 8. Parasites in blood of heifer No. 1.  
 " 9. " " heifer No. 2.  
 " 10. " " heifer No. 3.  
 " 11. " " Phillip's bull.  
 " 12. " " heifer No. 3.  
 " 13. " " heifer No. 1.  
 " 14. " " heifer No. 3.  
 " 15. " " Vancouver\* Island cow.  
 " 16. " " the Taylor cow.  
 " 17. Blood of the Inglis cow, showing basophilic granules.  
 " 18. Parasites in the blood of the Phillip's bull.  
 " 19. " " the Taylor cow.  
 " 20. Parasites in blood of cow dead from acute piroplasmosis x 1,200.  
 " 21. *Dermacentor reticulatus*, Fab, female ovipositing.  
 " 22. Ibid, enlarged.  
 " 23. *Melophagus* taken off deer at Langley.  
 " 24. Wings of deer *melophagus*.  
 " 25. Wings of *Mus. domestica* A., and *Stomoxys calcitrans* B.  
 " 26. Mast leucocyte in blood of horse, Peardonville.  
 " 27. Mast leucocyte in blood of horse, Cape Colony x 1200.  
 " 28. Parasites in blood of horse, Vancouver.  
 " 29. *Trypanoplasma* in blood of Taylor's cow.  
 " 30. Trypanosome from rat's blood, Vancouver.  
 " 31. " squirrel's blood, Mount Lehman.  
 " 32. " " "

*Hog Cholera.*

- Fig. 33. Mucosa of caecum showing '*Tricocephalus crenatus*.'  
 " 34. Mucosa of the ileum showing numerous small typical ulcers.  
 " 35. Mesenteric lymph gland showing a double infection Tuberculosis A, Hydatid B.  
 " 36. Showing trypanosomes from the rat and squirrel also trypanoplasma from Taylor's cow.  
 " 37. Composite picture of parasites observed in blood smears prepared from cases of natural and inoculated infection.  
 " 38. Parasites in chipmunk's blood, Peardonville.  
 " 39. " squirrel's blood, Mount Lehman.  
 " 40. Flagellate in the Taylor cow used for inoculating heifer No. 3.  
 " 41. Gamete in blood of heifer No. 3.

The magnification is 1,000 diameters in all the blood smear specimens with the exception of figs. 20, 27 and 28 which are magnified 1,200 diameters. The coloured plates were drawn by Mr. Judge.



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## RED-WATER INVESTIGATIONS.—THIRD REPORT.

The results embodied in my two previous reports, as well as in an interim report, acquainting you with the results of the trip, which I made in the Red Water areas of British Columbia and in the State of Washington, U.S.A., especially along the International Boundary, have embodied the study of the haemocytozoa and the post-mortem lesions of the Taylor cow, at Mount Lehman, also the fact that the role of the tick or other intermediary host remained to be determined.

About the end of last May I visited the Mount Lehman district and purchased from Mr. Phillips a cow in an advanced stage of the disease. I also obtained a cow from Mr. Taylor, which was not as emaciated as the one I obtained from Mr. Phillips. The latter sent his cow down immediately to the Station, but Mr. Taylor's was not delivered until the 12th of August, when it succumbed a few days after arrival from acute Red Water, associated with cardiac complications, no doubt intensified by the road journey from New Westminster,—see Chart D accompanying this report.

At the request of Mr. Ingils, I visited his farm, about 7 miles east of New Westminster, on the left bank of the Fraser River and about one mile from the Yale road. I found a typical case of Red Water in the early stages; the cow was in good condition. Photomicrograph No. 17, shows the condition of the erythrocytes and will be referred to later. Mr. Brown, who lives on the Yale road, a few miles from Mr. Inglis, has lost several of his cows from the same disease.

I interviewed Mr. Reynolds of Langley Prairie at New Westminster; he informed me that his farm was free from Red Water until he unfortunately lent his bull to a neighbour. About one month after it was returned he noticed that it was suffering from Red Water and at the present time six of his cows are also suffering from the same disease. Dr. Tolmie and Dr. Richards inform me that they have observed the disease on Vancouver Island, and the former also informs me that he lost a fine bull, imported from the State of Washington, U.S.A., some time ago. I received two yearling heifers from Vancouver Island for experimental purposes; the accompanying charts A and B show that there was something radically wrong with these animals on arrival at the Station. These heifers were inoculated with blood taken from Mr. Phillip's cow. The re-actions, etc., are fully dealt with further on, but nevertheless I considered it necessary to visit the farm from which they came. Dr. Richards very kindly drove me out to the farm and I obtained some blood smears from two cows. On my return to Vancouver I examined these smears, when I was astonished to find some of the erythrocytes in both of the animals exhibiting parasites very similar to some of those found in the Fraser river outbreaks.

In view of these facts I asked Dr. Tolmie for two heifers from a district beyond the coastal belt; he sent me two yearling heifers from Kamloops. At present one of them is inoculated with blood from Mr. Taylor's cow, (see chart B), the other being held as a control, (see chart H).

On the 13th of September, 1908 I visited Mr. Reynold's farm at Langley Prairie; there I saw 3 cases of typical Red Water in various stages, due, as he claimed, to the lending of his bull, as mentioned heretofore. The evidence that the bull brought the disease to the farm is fairly conclusive as it did not exist previous to the lending of the bull. It is, however, necessary to take into consideration the fact that this disease may lie latent for some time in the system without showing any clinical symptoms or systematic changes. It is possible that some animals may harbour the parasites and still show no untoward changes until the system becomes depleted by either associated disease or parturient changes. On the other hand, ticks may have been brought by deer or other animals from infected areas. This disease appears most frequently after parturition. I had an interview with Mr. Wark, whose farm is about 3 miles from Mr. Reynold's place; he has lost a lot of cattle from this



## SESSIONAL PAPER No. 15b

disease and figures his loss during the last few years at about \$1,000. He considers it risky to buy a cow, as the animal may not show any signs of the disease until about a month after purchase; such cases he states are often sold after the primary attack has subsided and by this means, the disease is very probably carried from one place to the other.

Blood smears were prepared from a young deer a few minutes after it was shot on Mr. Reynold's farm. On my return to Vancouver the blood smears were examined, when I observed the presence of a few hæmocytozoa, bearing a great resemblance to those observed in Red Water cattle. I also obtained some melophagi off this deer but whether they are the '*lipoptena cervi*' already described as occurring on red deer or a species peculiar to this coast, I am not prepared to state. On the 12th of November, 1908, I again visited the Mount Lehman district in search of ticks. I shot a squirrel close to Mr. White's farm and obtained several partially fed adult female ticks off its head,, close to the ears and eyes, some of which were forwarded to the Department at Ottawa.

I examined Mr. White's cow and Mr. Phillip's bull, both of which were suffering from typical Red Water; the cow had been ailing for some time and died shortly after my visit. The bull was ailing all summer and was treated with quinine and other tonics but finally had to be destroyed on February 2nd, 1909, vide chart K.

I addressed a meeting of farmers at the local hall and on inviting a discussion obtained some very valuable local information regarding this disease. It is evident from the information elicited that the diseased or infected localities are more extensive than hitherto admitted.

I visited Mr. Ball's place next day as it was here that I obtained the '*Dermacentor reticulatus*' last year. Mr. Ball informs me that he had never had Red Water on his farm until last year and had never observed any ticks on his cattle previous to the visit Dr. Tolmie and I made last year. I found ticks on the same ox, from which I got them last year and also on a 12 year old cow; both of these animals were suffering from Red Water. Only one fully fed female tick was taken off the cow. This tick has oviposited a large number of eggs and I await results. Several nymphs obtained at the same time hatched after I got home and three females were placed on Heifer No. 1 vide chart E. There were numerous nymphs and partially fed adults attached to both animals. I asked Mr. Ball to remove any fully fed ticks for me, but unfortunately during his absence, some one on the farm dressed the cow with paraffin, the result being that all ticks were destroyed. This was a very unfortunate occurrence, as both the animals were infected, the cow not in calf and no more cattle on the farm. I have never found any ticks on the hairless portions of any of the animals that I have examined; they seem to prefer the upper portions of the neck and along the sides of the back bone, where they cause a considerable irritation, very similar to what occurs on cattle in the Coastal area of Cape Colony, where the disease is sometimes described as tick farcy and by the natives it is called "Sitwaye". No larval forms were observed but remains of the nymphal ecdysis; it is therefore evident that this tick undergoes one moult on cattle. Some unfed female adults obtained from the above mentioned cattle were placed on a hare's ear, but they would not attach themselves.

During this trip I visited Mr. Peardon's farm, but found no ticks. The cattle that the ticks were present on in 1907 have since died of Red Water.

At Mr. Barn's farm, about a mile from Mr. Peardon's place and a little higher up the side of the ridge, I examined a horse with clinical symptoms bearing a great resemblance to a disease commonly described as biliary fever in South Africa; this case is fully dealt with in another portion of this report.

On the 15th of December, 1908, I again visited the above mentioned district, when I found that Mr. Ball's cow was becoming very anaemic. I took a number of blood smears from her and tested the blood, finding a hæmoglobin index of 70. The blood smears were examined the same evening and parasites were present similar to what I



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have observed in other cases. I visited Mr. Fry's farm where I found evidence of tick invasion amongst his cattle. Mr. Fry informed me that he had observed ticks on his cattle for some time past but that he had no Red-water amongst his stock. I called at Mr. Peardon's where I obtained 3 squirrels but only one of them harboured a single tick. On a farm adjoining Mr. Bayne's place, I came across an acute case of Red Water in a cow, also evidence of ticks and a history of same. In this case a well marked icterus was in evidence, temperature 104° Fahr., blood thin and brick coloured, haemoglobin test 40, urine well marked haemoglobinuria. This cow has since calved but is still suffering from the disease. Mr. Roberts, who is a neighbouring farmer and from whom this cow was purchased a few months previous to the date of examination, told me that he had no sickness on his farm. I also saw a horse suffering from a form of biliary fever with a history of recent tick infestation. This case will also be dealt with in another portion of this report.

#### PROBABLE SOURCE OF INFECTION.

In some of the infected areas in this province the idea prevails that this disease is caused by the cattle eating ferns in the hay. In contradiction of this supposed dietetic cause Russel, in his Rothamstead experiments dealing with fern hay, has recently found 'that while no careful comparison with straw seems to have been made, there is a firmly general opinion that bracken is nearly as useful as straw as far as the animals are concerned, although a competent observer has noted that the animals are not so good, indicating that they do not do quite so well on bracken as on straw.' The above extract is sufficient evidence to dispose of the fern theory regarding the cause of this disease, and furthermore, if bracken caused this disease many portions of Scotland and Ireland would simply be hotbeds of Red Water. I am perfectly satisfied that ticks are introduced into byres, either by bracken or hay, as I observed that a large number were brought into the box stalls at an agricultural show at Port Elizabeth, Cape Colony, by means of the slough reeds which were used for bedding. It is stated that in Norway the infecting tick (*Ixodes hexagonus*) is found on trees with flat leaves; on the contrary it is never found on trees with linear foliage (pines and firs). This may also apply to the conditions in this province, as the disease appears to be most prevalent where the alder and birch trees predominate. In South America, Lignieres does not consider infection by mosquitoes impossible but it is of rare occurrence. During the summer months the mosquitoes are a frightful scourge along the Fraser valley, and it is not unreasonable to presume that they may act as carriers of this disease from a previously tick infected animal to others. This question can only be decided by a series of experiments.

I have only obtained direct evidence of the presence of ticks on infected cattle in the neighbourhood of Peardonville. I regret that I have been unable to obtain more definite information on this point. As already mentioned in my interim report, I have, however, been able to learn through the kindness of Professor Neumann, that the ticks found on a cow, since dead of Red Water at Peardonville, are the *Dermacentor reticulatus*, Fab. Professor Neumann also informs me that the tick found on the squirrel (*Sciurus Hudsonius bafleyi*) is probably an undescribed species of *Ixodes*.

I am indebted to Mr. F. Kermode, Curator of the Provincial Museum, Victoria, B.C., for information regarding the various species of squirrel found in these areas.

Photomicrographs No. 21-22, show the female tick obtained at Peardonville ovipositing.

#### BLOOD CHANGES.

The basophilic granulations were very numerous in Mr. Inglis' cows' blood. *Vide* photomicrograph No. 17.



## SESSIONAL PAPER No. 15b

According to Plehn, in human malaria, basophile or primitive granules are never wanting during the latent periods. The same authority also notes that the appearance of a large number of mononuclear leucocytes announces the continuance of the latent infection.

In reference to chart C., Cow No. 1, natural infection, accompanying this report, shows that on the tenth day of observation a large number of mononuclear leucocytes were in evidence. I have noted this change in other cases of natural infection, as well as in the experimental stock.

Lignieres refers to the basophilic granulations in South American cattle, as 'Globules geants pointilles'—red cells 2—3 times the normal size, containing granules of variable dimensions. Lignieres produced these changes by repeated bleeding and noted that they were still present for some time after the last bleeding operation.

In human malaria the basophiles have been described as a sign of stroma degeneration. Poly-chromasia is also stated to indicate degeneration or regeneration of red cells or both. This feature has been especially well marked in nearly all the blood films examined from infected cattle.

According to Plehn, in human malaria the first or primary period of latency extends from the infection to the appearance of fever, while the period extending between the after-attacks can be described as intermediate periods of latency; this period may extend for months. I think the above is a fairly accurate description of the changes in bovine piroplasmiasis in this province. Reference to the accompanying charts, as well as the fact that the fatal termination usually results after several attacks and final association with secondary or terminal complications, complete a picture bearing a striking resemblance, clinically, to some of the severer forms of tropical human malaria.

The icterus observed in animals is usually ascribed to two causes: 1st, retention of bile; 2nd, haemolysis. The peculiar icteric condition observed among Red Water infected cattle in this province, is probably due entirely to haemolysis. The appearance of the above mentioned granular basophilia in many cases supports this theory. Hayem considers that the yellowish colourization of the skin in haemoglobinuria is a special pigmentation and not that of true jaundice,—and as far as is known in all cases when haemolysis occurs during life, the haemoglobin liberated does not give rise to bilirubin.

Red blood cells being impermeable, no changes take place in the number of inorganic molecules, but by endosmosis  $H_2O$  passes into them, causing them to swell up, and if decrease in the plasma is sufficient, eventually, to burst and to extrude their haemoglobin.

Haemolysis is probably due to three factors:—

1. Injury to the stroma of the red cells by parasites.
2. Presence of a haemolysin.
3. Accessory factors.

Sulphates decrease resistance of cells to haemolysis, while chlorides, on the other hand, increase it.

It is interesting to note that Marchiafava and Bignami have also observed more or less anaemia in cases of larval malarial fever associated with haemolytic jaundice,—some possible change in the blood serum disuniting its isotonicity is present, rendering uninfected red cells immensely vulnerable.

Supposing such changes occur in the Red Water in this province, it will to some extent account for the presence of haemoglobinuria in a marked form, with a low thermal curve and only a few parasites in evidence in specimens prepared from the peripheral circulation.

The condition of the blood plaques or platelets was very interesting in some of the slides examined. They appeared in racemose masses at certain portions of the smear but in the well marked clinical cases did not agglutinate in masses, and in



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some cases appeared to be present in increased numbers. The direct estimation of the numbers present was not attempted as it was an impossibility, with the assistance at my disposal, to carry out the technique necessary for an observation of this nature. Haemoglobinaemia was observed in Heifers 1 and 2, Charts A and B, by placing a small quantity of blood in a cold place for 24 hours, the separated serum being coloured a ruby red. The leucocytic count was not carried out regularly and calls for no special mention, leucopenia being invariably observed, except when specially noted on the accompanying charts.

## PARASITES.

Failure to demonstrate piroplasmata does not by any means exclude piroplasma infection, such negative evidence thus depends for a final diagnosis, on its co-relation with other clinical signs and symptoms. The many relapses or attacks that occur in this form of Red Water under consideration are, as already mentioned undoubtedly due to some latent infection. According to Schaudin, in human malaria, female gamettes in the internal organs are accountable for relapses in that disease. It is well known that the piroplasma remain for many years in the so-called immune stock. According to Von Wasselewskie—'das Plasmodium praecox nach dem acutem vermehrungsstadium sehr sparlich in Blut zu finden ist, so eignet sich das Blut chronisch kranke Thiere nicht zu Demonstrationswecken.' The above observation practically coincides with the chronic form of piroplasma infection seen in this province.

The form of this disease principally observed here is a chronic, mild form lasting for months, affecting chiefly the kidneys, bladder and heart, *vide* photograph, Fig. 5, of bladder from Mr. Taylor's cow, Mount Lehman. Another form, extremely mild and scarcely detected clinically, undoubtedly occurs, and with the above mentioned form is observed in swampy ground.

The form of the parasite varies greatly in the peripheral blood—coccus-like bodies of varying dimensions, with a more or less irregular outline, the periphery staining darker than the middle portion, a slight portion of the margin exhibiting chromatin staining; pear-shaped bodies and various form of flagellates, also some large ovoid forms; in the peripheral blood, some forms bearing a great resemblance to some of the forms of the human malarial parasite were observed. I have observed a coccus-like form in some of the supposed healthy cattle in the infected areas. Lignieres states that the parasite found in France exhibited a marked difference to those observed in South America.

In smears prepared from the squirrel's blood in the infected areas, I have observed typical trypanosomes, but whether these parasites are similar to those found in the Indian squirrel (*Funambulus palmarum*) or a distinct species peculiar to British Columbia, I am unable to state. Photomicrographs No. 31 and 32, show the trypanosome in the squirrel's blood. Photomicrograph No. 38, depicts the parasite observed in a chipmunk's blood; this animal was obtained at Peardonville.

## TICK EXPERIMENTS.

Ticks were placed on the ear of Mare No. 1 and on the body of Heifer No. 1. The mare was placed in a box, which was stood over a tub of water,—and two unfed adult female ticks hatched at the laboratory from nymphs obtained from Mr. Bell's cow, near Peardonville, were placed at the base of the ear. At first the ticks appeared as if they would attach themselves, but next morning, after a long search, both the ticks were recovered in a little hay left in the box.

Three unfed adult female ticks were placed on Heifer No. 1 at the quarantine station, but also failed to attach themselves. No doubt, the tick irritation caused the heifer to rub them off, as the pajama was found torn to pieces in the morning. An experiment like this requires a large number of ticks which I unfortunately could



## SESSIONAL PAPER No. 15b

not obtain. Photograph No. 21 and 22 shows a female *Dermacentor reticulatus*, ovipositing. I have one tick at present which has oviposited a large number of eggs and I trust I will be able to hatch out some larvæ. It was placed in moss and filter paper in the bottom of the Petridish, moistened with water at regular intervals, and kept at a temperature of 29°C; ovipositing commencing on January 28, 1909.

## EXPERIMENTAL INOCULATIONS.

*Animals.*—Two yearling heifers received from Vancouver Island on May 1, 1908, were kept under close observation for 24 days previous to inoculation, *vide* Charts A and B, accompanying this report. On May 27, 1908, they were inoculated as follows: 5 ccm. of blood (citrated) taken from Cow No. 1 (Phillips), *vide* Chart C, was injected subcutaneously behind the shoulder of both heifers. Heifer No. 2 received a further inoculation of 15 ccm., citrated blood, also from Cow No. 1, on June 8, 1908, subcutaneously behind the shoulder. On the same day as the first inoculation was completed, a male guinea pig No. 1 was inoculated intraperitoneally with 2 ccm. of the same blood as heifers No. 1 and 2. This guinea pig was inoculated to serve as a control against a possible *Pasteurella* or other septicaemic infection and also to observe possible blood changes, as well as the appearance of any Trypanosome infection.

Heifer No. 2 received a second inoculation in order to determine the effect of two inoculations; if the two inoculations were not fatal, the subject could receive a further inoculation from a virulent case, and if it then survived it could be used for the purpose of providing immunity by blood inoculation. The various changes in the blood counts, the presence of haemocytozoa, etc., are fully enumerated in the accompanying charts E and F.

You will observe that the fever curve in heifer No. 2, chart F, attained its maximum on the 18th day after the first inoculation and on the 6th day after the second inoculation. In heifer No. 1, chart E, the fever curve reached 104.3 on the 11th day and 103.3 on the 83rd day after inoculation. The blood of both of these animals was examined as often as possible during a period extending from 198 to 300 days, *vide* charts E and F. Blood counts were also made at stated periods, the results being embodied in the accompanying charts.

The guinea pig inoculated at the same time as heifers No. 1 and 2, with blood from the same cow (Phillips) remains healthy. On July 6, 1908, a half-grown hare was inoculated with 2 ccm. of blood, drawn into sterile normal saline solution from the ear of heifer No. 2, *vide* chart I; the injection was made into the posterior auricularis vein (ramus lateralis posterior of the vena auricularis posterior). In this animal a few bodies resembling parasites were observed in the blood on the 5th day after inoculation, and again on the 20th day *vide* chart I. The animal was found with a broken leg on the 6th day after inoculation, the fractured limb was set and in a few weeks was completely united. The guinea pig and the hare, as experimental animals were used as controls against a possible septicaemic infection. I have, however, not lost sight of the fact that these animals may harbour endocorpuseular parasites independent of the inoculated bovine parasites.

On August 17, 1908, cow No. 2, received from Mr. Taylor, of Mount Lehman, was bled, 100 ccm. being taken from the right jugular vein. Heifer No. 3, chart G, received from Kamloops was cast (a range animal), blood smears taken from the ear vein and 60 ccm. of defibrinated blood taken from cow No. 2 was injected subcutaneously behind the shoulder.

Guinea pig No. 2, chart J, received 2 ccm. of defibrinated blood from the same source as heifer No. 3, intraperitoneally. Nothing was observed in the blood of this animal, although on the 11th day after inoculation the temperature rose to 103, *vide* chart J, and it is noteworthy that a similar rise took place in heifer No. 3, inoculated



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at the same time, *vide* chart G. At this stage a few parasites were noticed in the blood of heifer No. 3. Guinea pig No. 2 was found dead on the morning of September 4, 18 days after inoculation. The autopsy revealed slight post-mortem staining so that death had taken place some time before the examination was made. The liver was congested, the peritoneal surfaces hyperaemic, while in the lungs marked congestion was evident and on the sides of the thorax a mass of coagulated blood was present. It appears from evidence obtained later, that an emigrant's dog broke into the cage and if it did not kill the guinea pig at once, it evidently died from the effects of the contusion on the sides of the thorax. The lesions observed at the autopsy were not in keeping with the animal's condition on the previous day.

In heifer No. 3, chart G, examination of the blood smears taken previous to the inoculation showed no indication of either haemocytozoa or corpuscular changes. On the 11th day after inoculation a few parasites were observed. The temperature reached 103° Fahr. on that day and on the 96th day it reached 104° Fahr., but up to date no special rise has been observed. It being necessary to cast this animal every time that she was bled, the blood examinations were consequently limited in number. Heifer No. 2 is at present on Mr. Phillip's farm, Mount Lehman, as Red Water has been prevalent there for some time. The accompanying chart I gives the temperature of this animal on the farm from December 12, 1908, to January 31, 1909. It will be observed that higher temperatures are recorded, especially soon after arrival at the farm, than were observed during the period the heifer was at the Vancouver Quarantine Station.

She has been bred and Mr. Phillips reports that she is at present in good order and has shown no signs of any Red Water infection. The chart for February and March is not included, as the variation recorded is so slight as to be of no practical importance. Reference to charts E and F shows that a light variation also occurred with heifers 1 and 2 during the same period.

Guinea pigs resist, according to Nicolle and Adil-Bey, an injection of normal cattle blood in quantities up to 5 ccm., while blood from cattle suffering from piropiasmosis is toxic for guinea pigs, 1 ccm. killing those animals rapidly when injected intraperitoneally. Cattle, rabbits, dogs and guinea pigs are also stated to resist infection with equine malaria in South Africa.

#### PROPHYLACTIC MEASURES.

Medicinal treatment is only palliative. I, therefore, suggest inoculating the young stock on infected farms with blood from a recovered case (either natural infection or inoculated recovered calves), and the use of some non-poisonous dressing during the tick, fly, and mosquito season. Where no disease at present exists, I would more especially suggest the application of the dressing.

Finally, I believe that some legislative measure to control the sale of infected cases during the quiescent period of the malady should be instituted, thereby limiting the spread of the disease.

#### FLIES.

Many species of blood-sucking flies are prevalent during the summer months, in the Red Water areas. Near Peardonville, also in Vancouver, I obtained some 'Stomoxys calcitrans,' *vide* photo No. 25, I also found the 'Haematobia serrata' or 'horn fly' very prevalent. I have observed on deer large numbers of 'Melophagi' with bidentate claws, small eyes and extremely minute wings, with one large spot and almost invisible veins; whether this is the 'Lipoptena cervi' already mentioned as occurring on 'red deer' or another species peculiar to this country, I am unable to say, *vide* Photos Figs. 23, 24. There are many other large blood-sucking flies; one



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form occurs in cattle, which is commonly known as the 'deer fly' and is probably the '*Hamatopota pluvialis*.' The wings are grey with brown coloured spots and the body is also grey with brownish cross stripes.

## EQUINE DISEASE.

In the month of April 1908, whilst attending to an outbreak of infectious pneumonia, in a stud of draught horses in this city, I had occasion to observe some peculiar icteric lesions and pigmentary petechial spots on the mucosa of the eye, especially over the membrana nictitans in a severe case of pneumonia dextra multiplex, with diffuse hepatization and extreme anaemia. The icteric lesions appeared about the 15th. day after the onset of the disease and occurred only in one animal. The similarity of these lesions, to what I have observed in some forms of equine biliary fever in South Africa, were very marked. Blood smears were therefore prepared, the blood was observed to be watery, very light coloured and coagulated very slowly. Microscopical examination revealed the presence of a few intra and extra corpuscular bodies, which morphologically resemble some of the forms observed in cattle suffering from Red Water in this province. The accompanying chart M, shows the temperature curve of this animal during the last 11 days that it was under observation. I found the next case of this nature at Mr. Bayne's farm near Peardonville, close to the American line, on the 13th. of November 1908. This animal exhibited asthenia, the mucosae of the eyes were blanched and indistinct petechial spots were present on the membrana nictitans. Blood smears were prepared, the blood was watery, light coloured and coagulated slowly. On examination a few intra and extra corpuscular bodies were observed similar to those observed in the above mentioned case in Vancouver. A tonic was prescribed and when the animal was seen again on December 15th., 1908, marked improvement had taken place. On the adjoining farm I found a similar case with a distinct history of previous tick infestation. The owner stated that a neighbour and himself had removed a lot of large fully fed ticks off this horse a few weeks previous to my visit. They were attached in the submaxillary region. The blood was watery and light coloured with a haemoglobin index of 70, the visible mucosae were lemon coloured and well marked petechial spots were present on the membrana nictitans. The horse was recumbent and raised with difficulty, it was suffering from constipation, which was relieved but it did not recover. The owner informed me about another case that had been observed voiding red urine, whilst at work on the road. Blood smears were prepared and on examination intra and extra corpuscular bodies were observed morphologically indistinguishable from those found in the previous cases. In the beginning of 1909, I had occasion to examine a horse about 18 years old suffering from necrosis of the fatty frog with a partial separation of the hoof. This animal had been very anaemic and difficult to keep in condition for some months previous to the advent of the foot lesion. Observing symptoms of urinary derangement, I passed the catheter, when I was astonished to find a well marked haemoglobinuria was present. Blood smears were prepared and on examination intra and extra corpuscular bodies were observed indistinguishable from those above described in the other cases. This case presented a haemoglobin index of 50. I consider that the appearance of the haemoglobinuria and blood changes in this and the first case observed probably a recrudescence of a previous infection. Similar conditions were observed in Africa, and recorded by Koch and myself, whilst working with horse sickness, a dual infection taking place, the latent biliary fever organism suddenly becoming active in a depleted system. I also had occasion to observe in all of these cases a peculiar type of mast leucocyte, which I have never observed in any animal but the horse, and only in biliary fever in Africa, previous to the occurrence of the above mentioned cases, vide photomicrographs Nos. 26, 27, accompanying this report.



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The above observations are interesting and I think the inoculation of an old horse with blood from a typical bovine case would assist in determining the nature of this disease. It is well known that the equine and bovine varieties differ in South Africa and possibly a difference also exists in this Province. Of course the South African form is not transmissible by direct inoculation, vide Theiler and Koch's experiments in Journal of Hygiene.

## HOG CHOLERA.

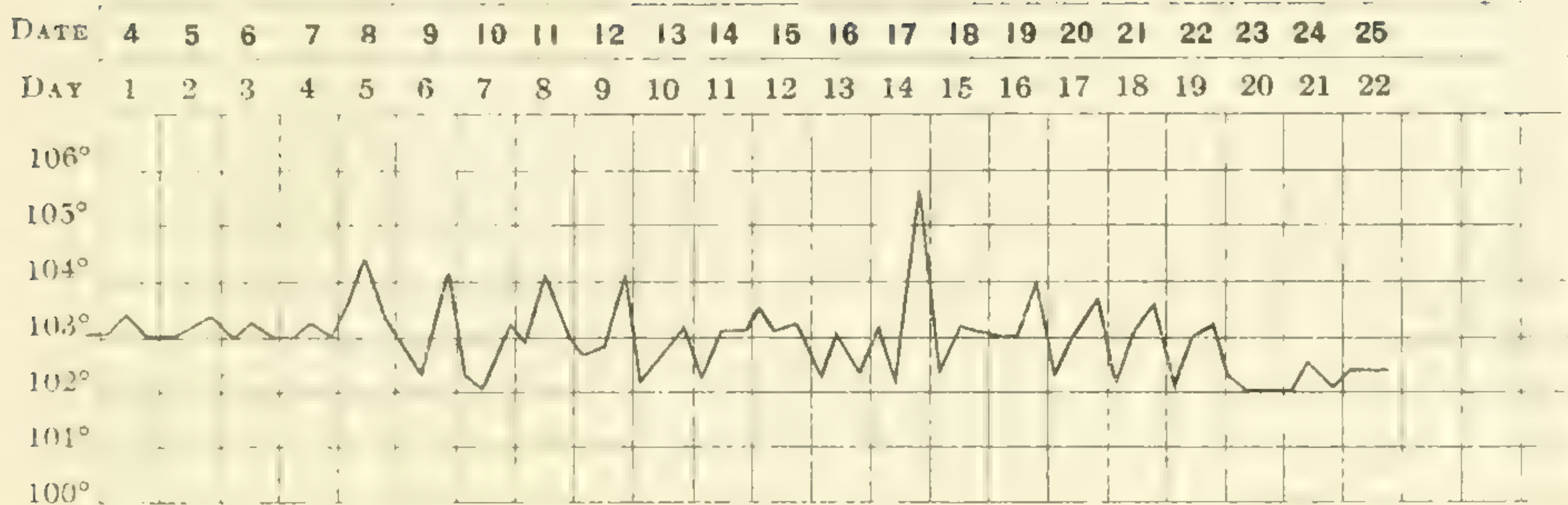
Dr. Tolmie has forwarded me numerous specimens from recent outbreaks in this Province. These have been the subject of special reports. In one outbreak, which I investigated near New Westminster, I found in the caecum of several of the infected animals, numerous worms attached to the mucosa, 'Tricocephalus crenatus' vide photo Fig. 33. I must draw attention to the shocking condition of the Chinese piggeries. In the neighbourhood of the Hastings Park, the filth is beyond description.

Respectfully submitted,

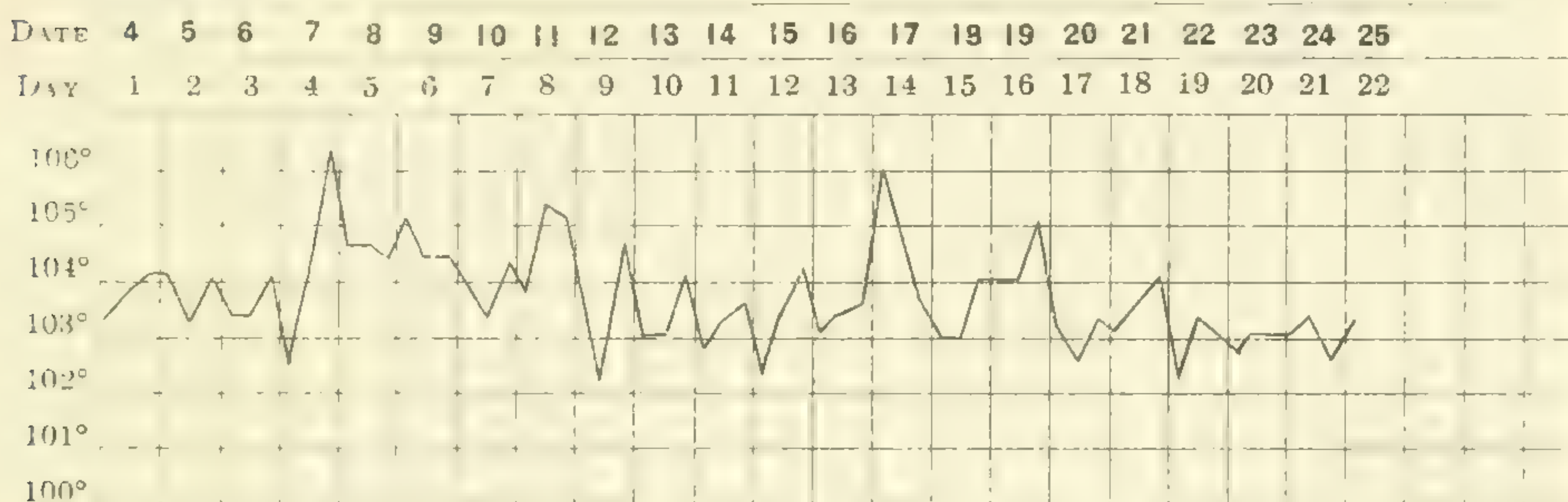
THOS. BOWHILL, F.R.C.V.S., F.R.P.S.



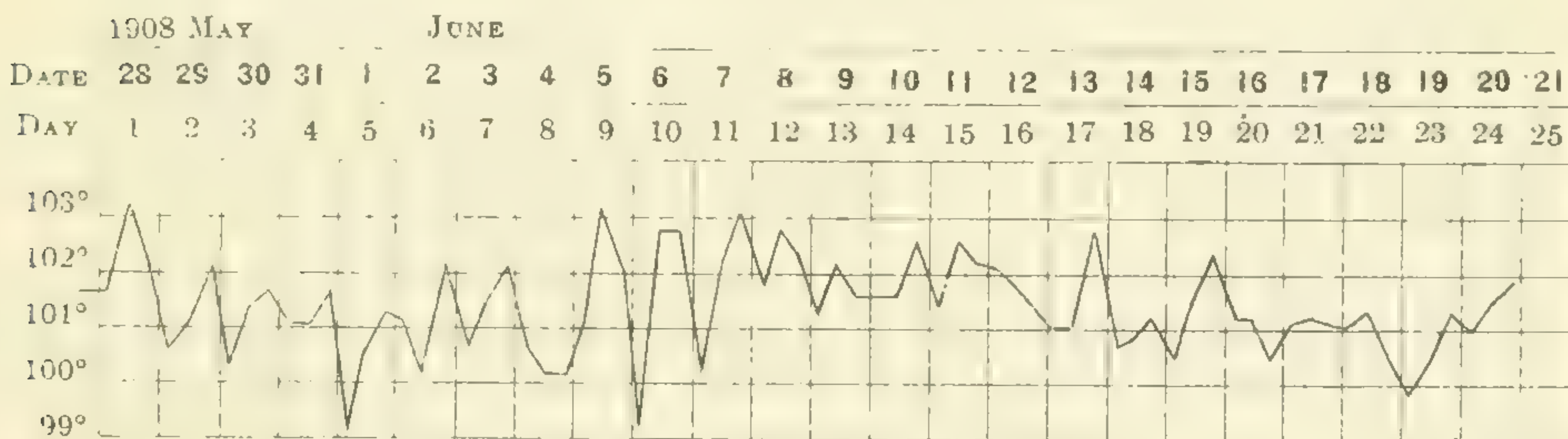
RED WATER  
CHART A  
Vancouver Island Heifers  
Heifer I  
1908 MAY



RED WATER  
CHART B  
Vancouver Island Heifers  
Heifer II  
1908 MAY



RED WATER  
CHART C  
Cow I "dry"  
Natural infection; 2nd attack, from Mr. Phillips' farm, Mt. Lehman.

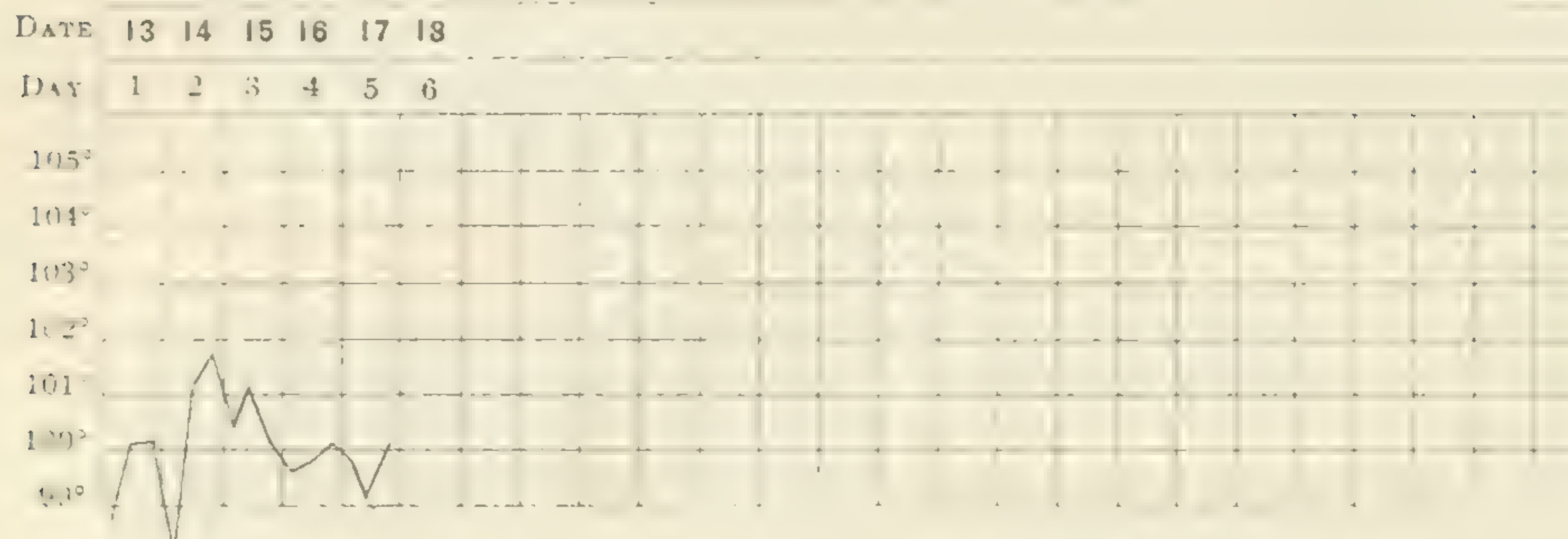


The following notes were made from 1st day to 24th day on Chart C.

- |   |  |
|---|--|
| 1 Erythrocytes = 4,200,000.                           | 13 Bled from right jugular vein, 50 c.c.m. withdrawn |
| 1 Haemoglobinuria present.                            | 14 Lugols solution hypodermically; got up alone      |
| 2 Haemoglobinuria present.                            | during night.  |
| 3 Blood smears show only a few parasites.             | 15 Could not get up.                                 |
| 4 Urine normal color.                                 | 16 Decubitis persisting. Raised with sling.          |
| 5 General condition improved.                         | 17 Decubitis.  |
| 6 Off feed. Eyes sunken and glassy.                   | 18 Decubitis.  |
| 7 Extreme anæmia, blood lepacenic. Adhering to        | 19 Growing weaker.                                   |
| slides with difficulty.                               | 20 Still weaker. Tonics, &c., no use                 |
| 8 Very weak raised with difficulty.                   | 21 Growing weaker.                                   |
| 9 Growing weaker, haemoglobinuria again present.      | 22 Bloody coated faeces passed.                      |
| 10 Large number of large mononuclear leucocytes in    | 23 Bloody coated faeces passed.                      |
| smear.  | 24 Erythrocytes = 3,200,000.                         |
| 11 Parasites more plentiful.                          | *Found dead on morning of June 20th, 1908.           |
| 12 Strychnine hypodermically. Raised with difficulty. |  |



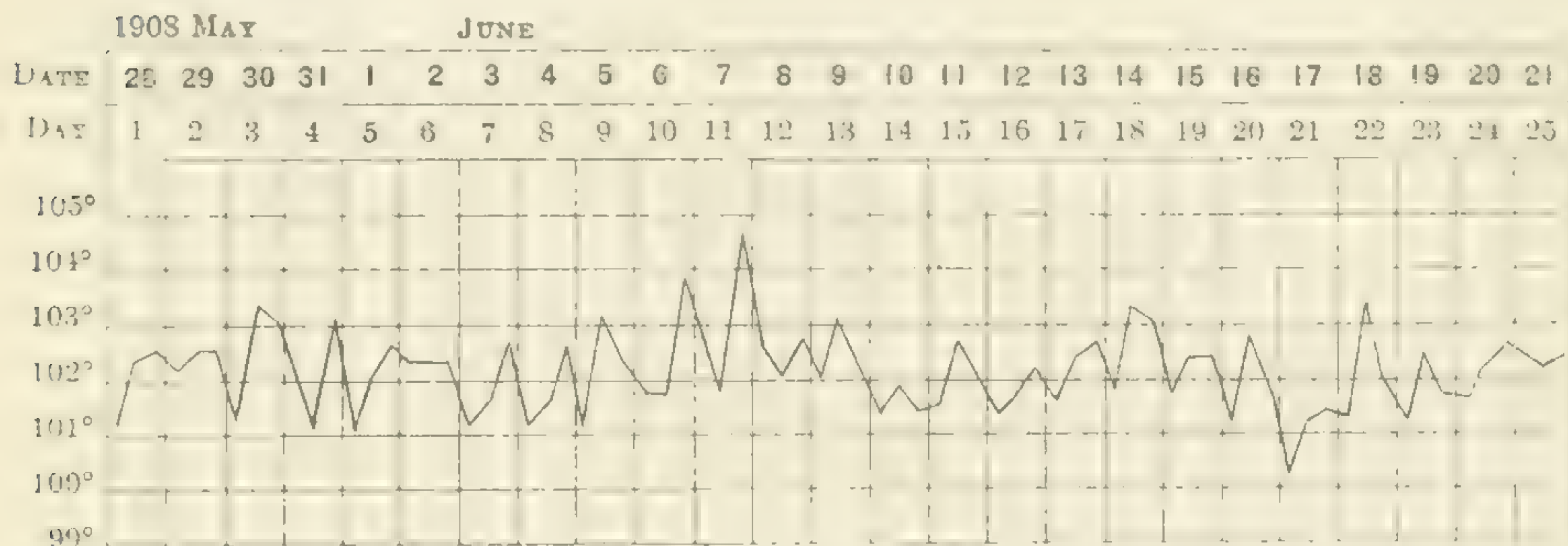
RED WATER  
CHART D  
Cow II  
Natural infection; 3rd. attack from Mr. Taylor's farm, Mt. Lehman.  
1908 AUGUST



- 1 Haemoglobinuria present.
- 2 do.
- 3 do.
- 4 do.
- 5 100 c.c.m. blood drawn from left jugular vein  
Few parasites per smear.
- 5 Erythrocytes=4,160,000.

\*Died morning of August 18th, 1908  
\*The journey on foot from New Westminster hastened the animal's death.

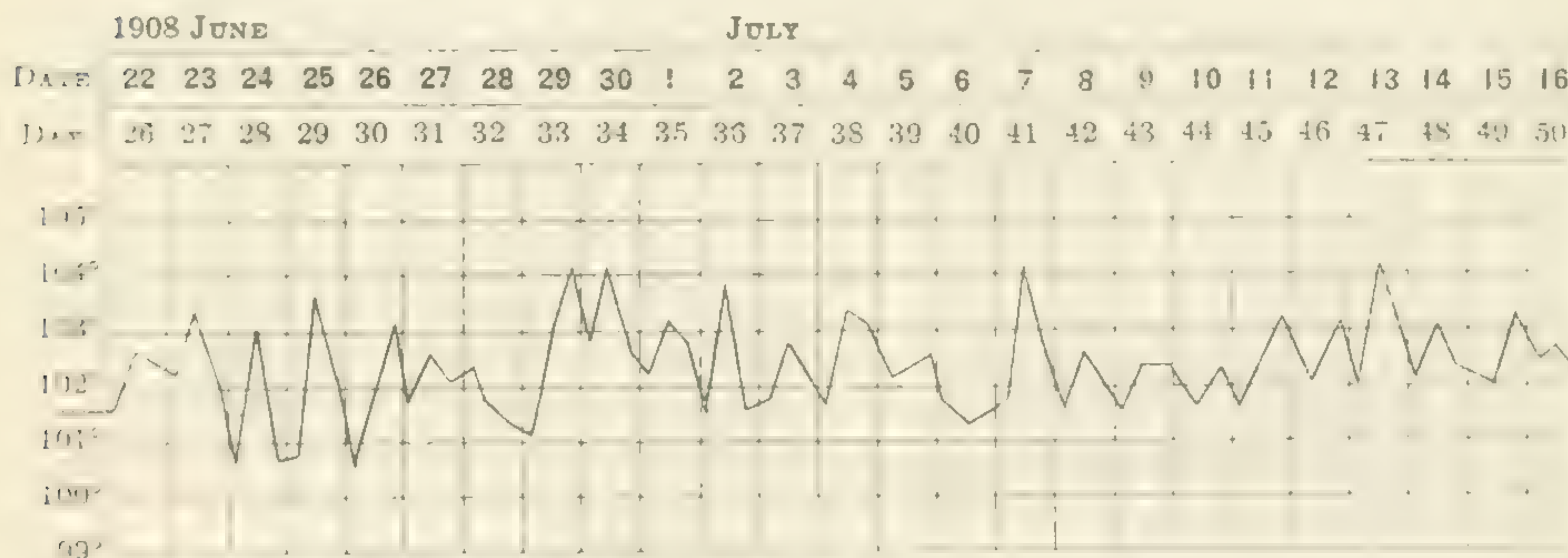
RED WATER  
CHART E  
No. 1 yearling heifer from Vancouver Island.  
Infecting material,—5 c.c.m. blood (citrated) subcutaneously from Red Water cow No. I, Mt. Lehman,  
May 27th, 1908.



- 21 Erythrocytes=6,400,000
- 25 A few parasites present.

- 1 Erythrocytes=7,400,000
- 12 Parasites in blood

CHART E, Continued



- 30 Only a few parasites per smear.
- 36 Parasites more plentiful.

- 40 Erythrocytes=5,650,000.
- 44 Diarrhoea.



# RED WATER

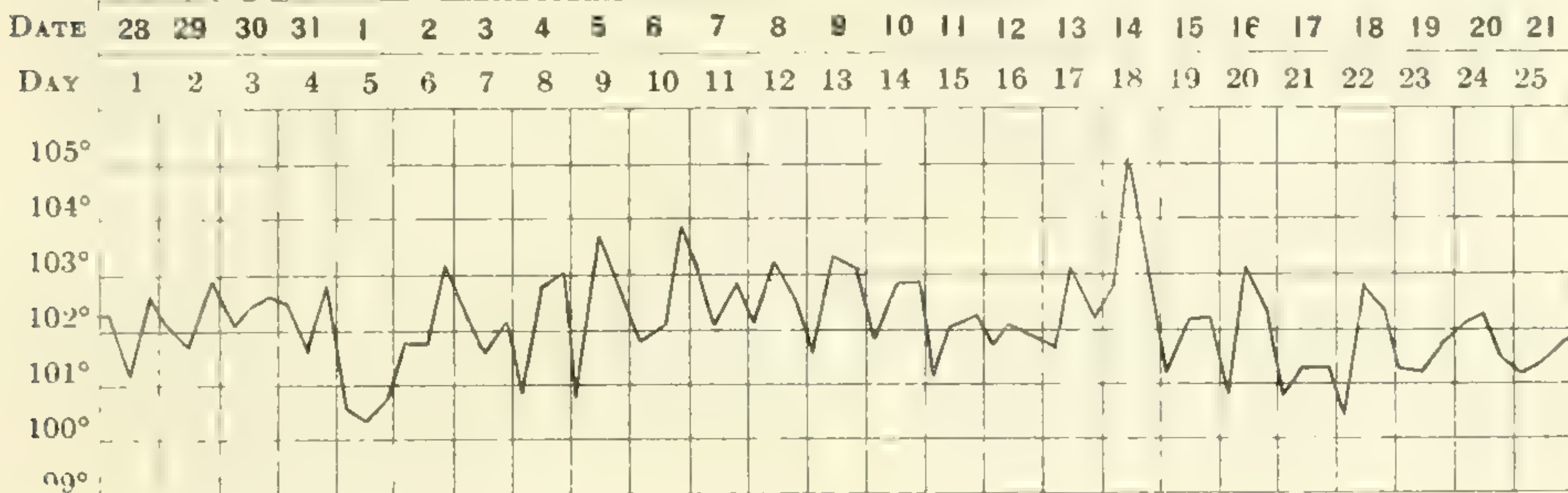
## CHART F

No. II yearling heifer from Vancouver Island

Infecting material,—5 c.c.m. blood (citrated) from Mt. Lehman cow No. I, subcutaneously

1908 MAY

JUNE



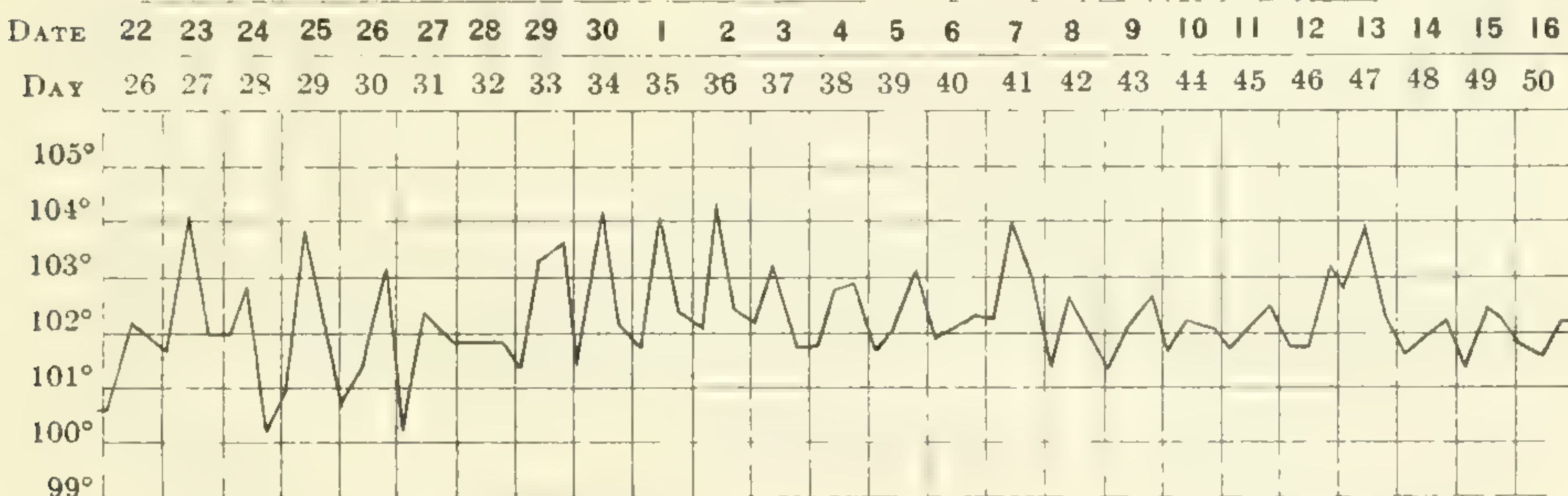
- 1 Erythrocytes=7,840,00  
 12 A few parasites on peripheral blood.  
 13 Received 13 c.c. m. of blood X normal saline subcutaneously from cow No. 3.

- 18 }  
 19 } Parasites present in blood. Several per smear.  
 20 }  
 21 }  
 22 }  
 23 Parasites decreasing per smear.  
 23 Erythrocytes=5,340,000.

### CHART F, Continued

1908 JUNE

JULY



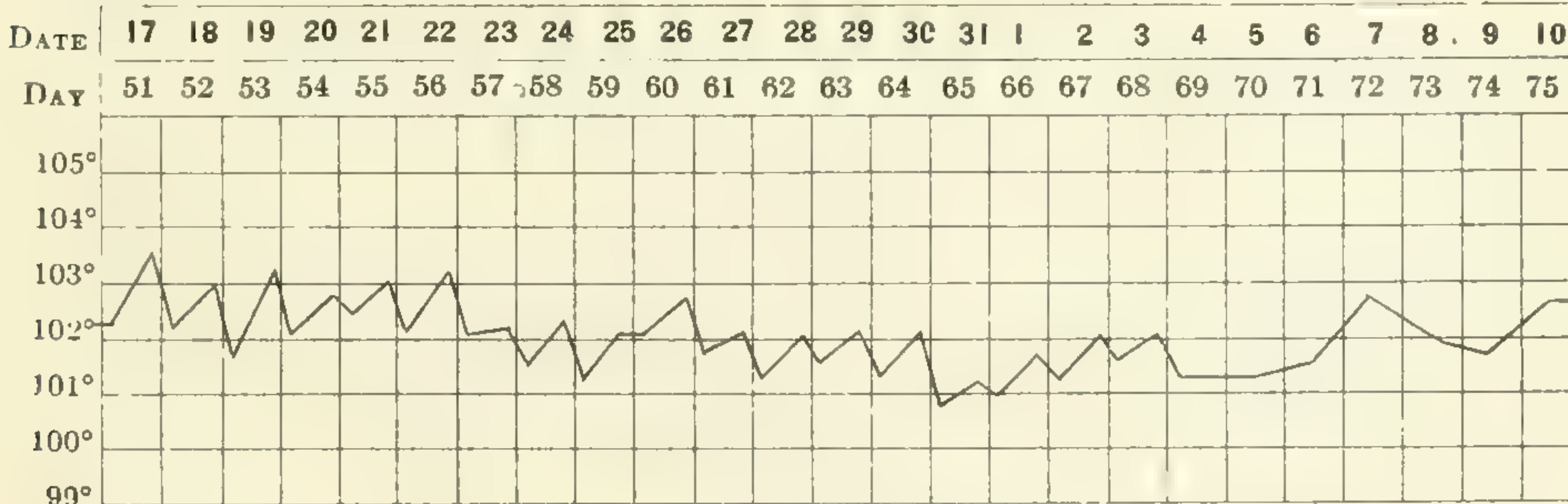
- 27 A few parasites per smear.  
 30 A few parasites.  
 34 Parasites more plentiful  
 40 Erythrocytes=4,200,000.

- 41 Parasites present.  
 43 A few parasites.  
 44 Diarrhoea.

### CHART F, Continued

1908 JULY

AUGUST

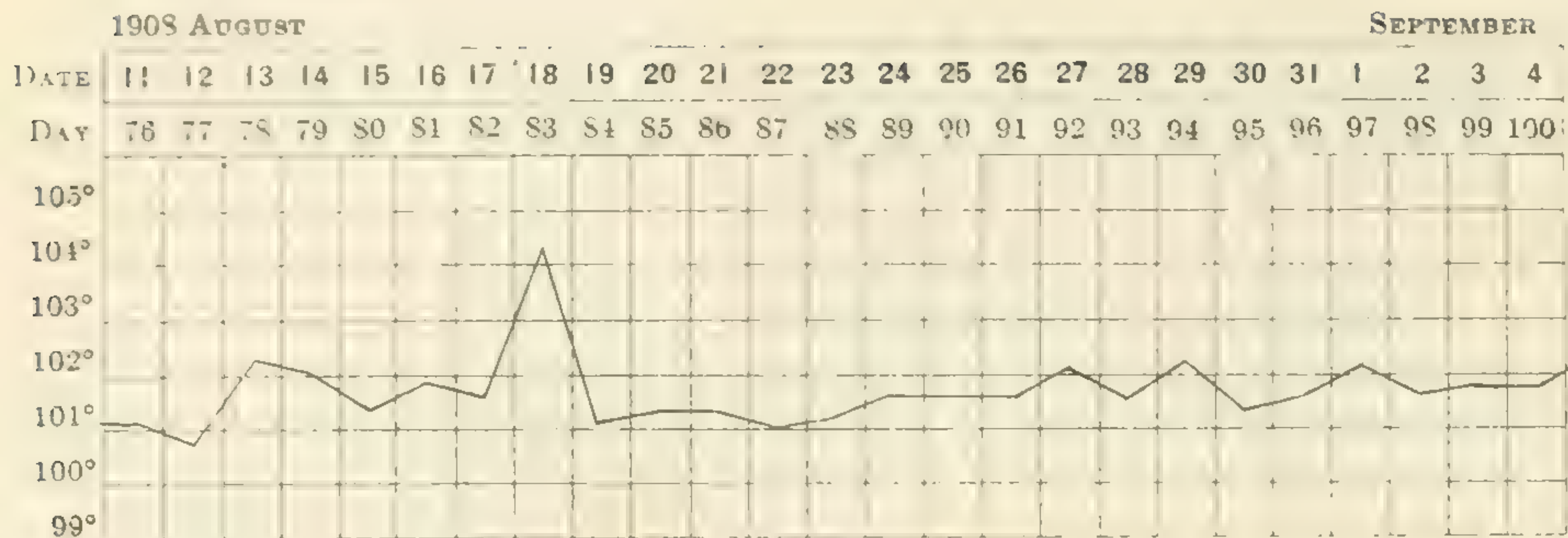


- 59 A few parasites per smear.  
 59 Erythrocytes=7,200,000.

- 72 A few parasites.



CHART F, Continued



83 Parasites. present.

CHART F, Continued

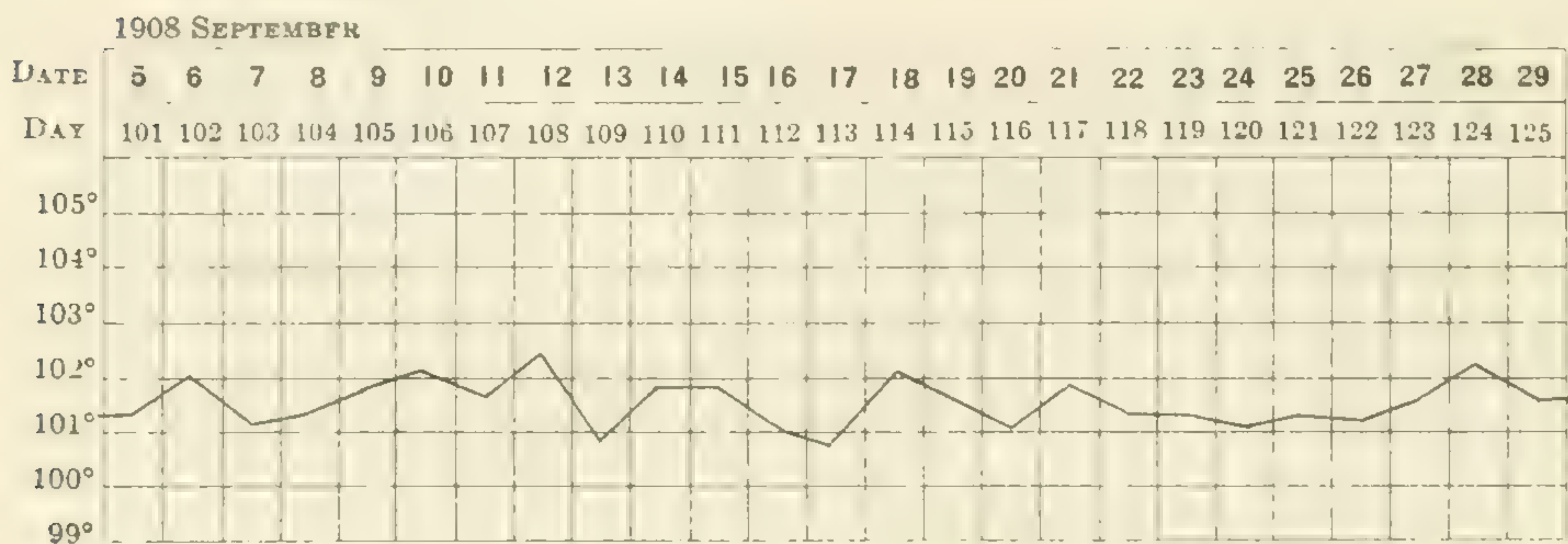
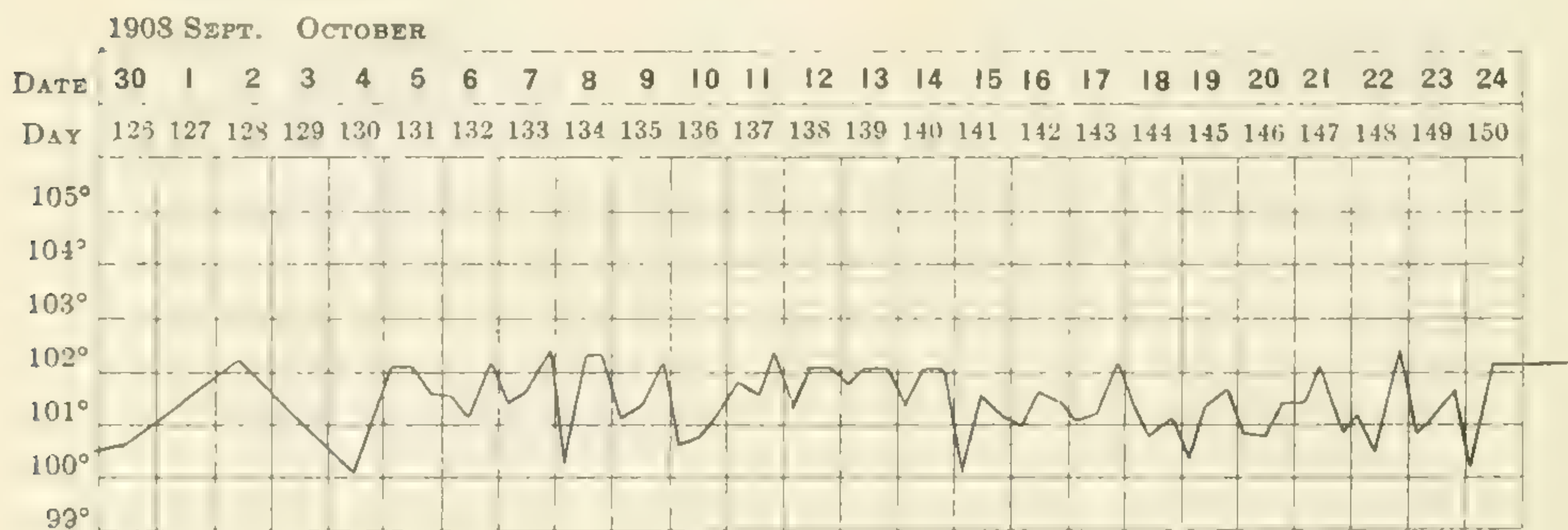


CHART F, Continued



136 Erythrocytes=6,800,000.

139 Yellowness of skin and visible mucosa not so marked.



CHART E, Continued

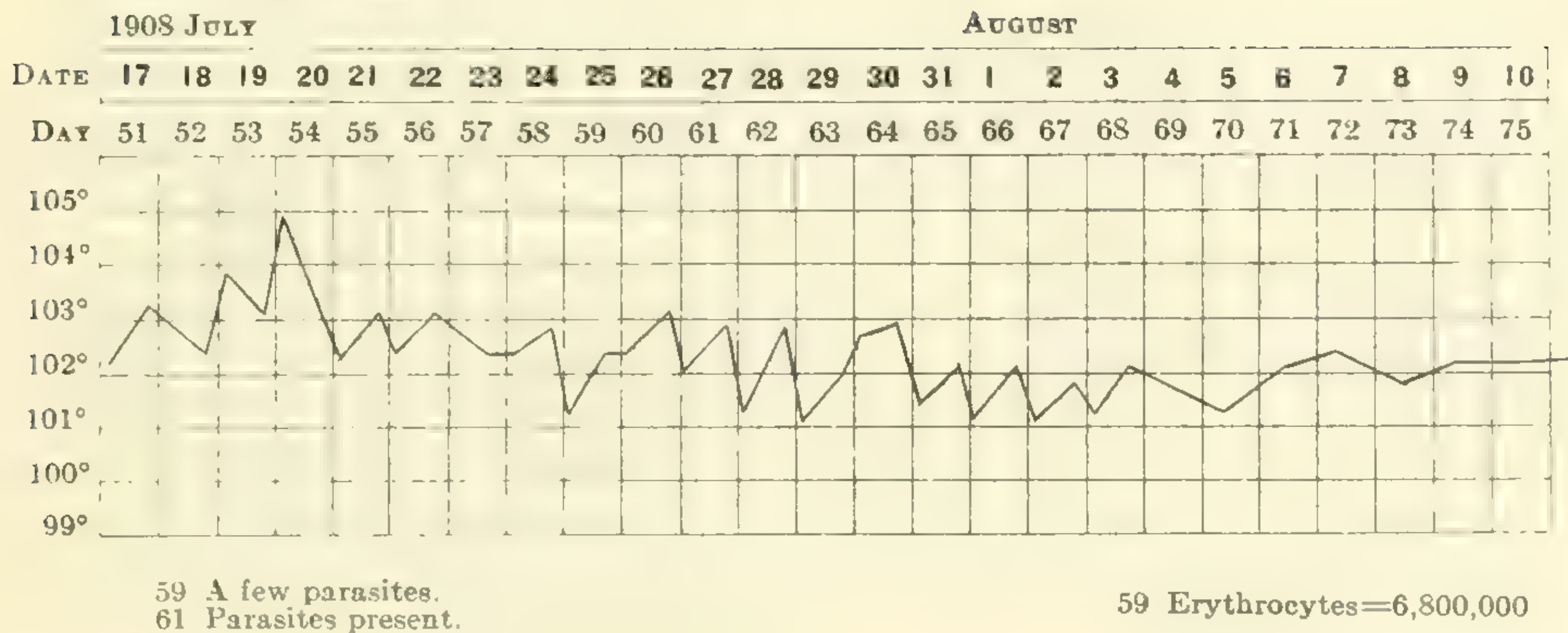


CHART E, Continued

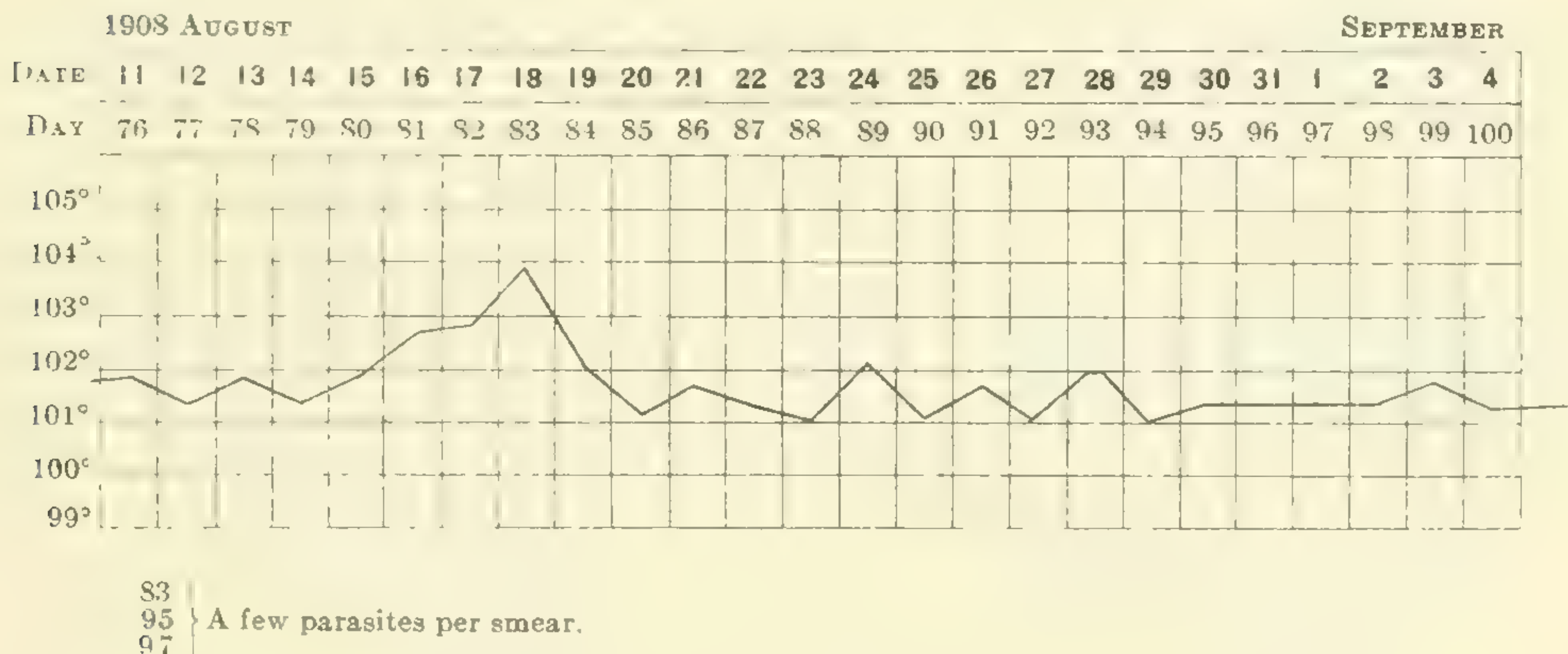
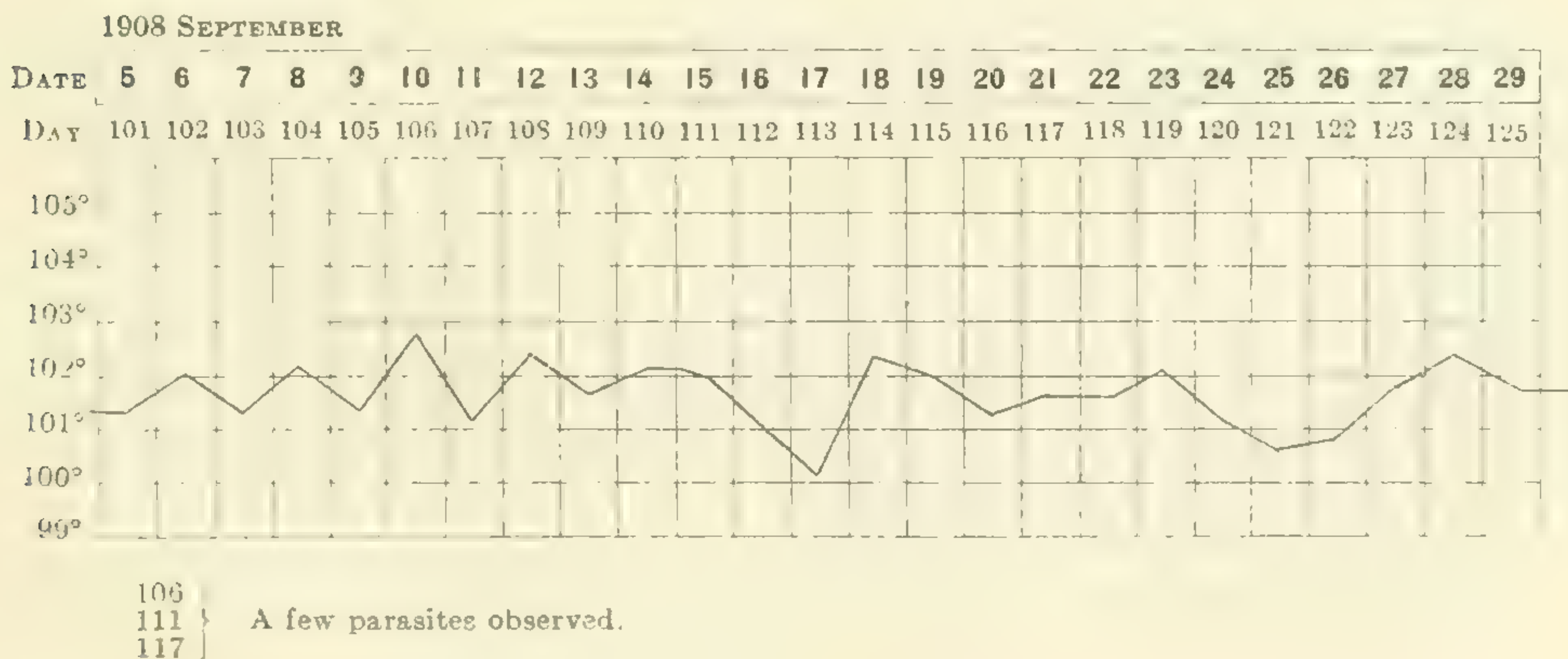


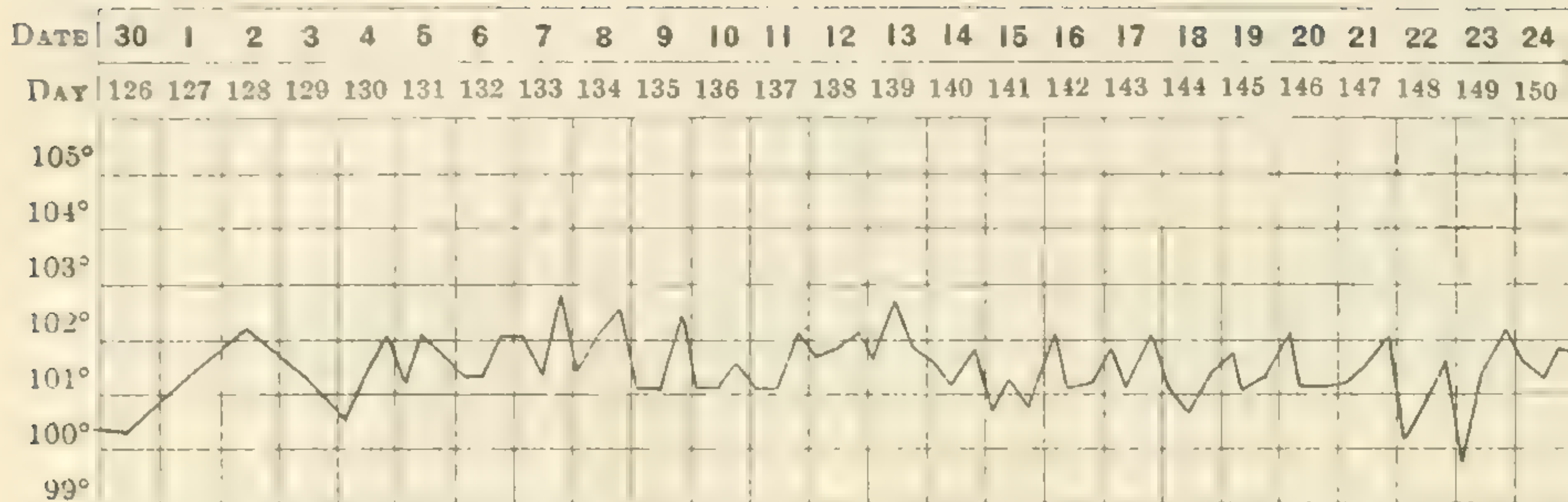
CHART E, Continued





# CHART E, Continued

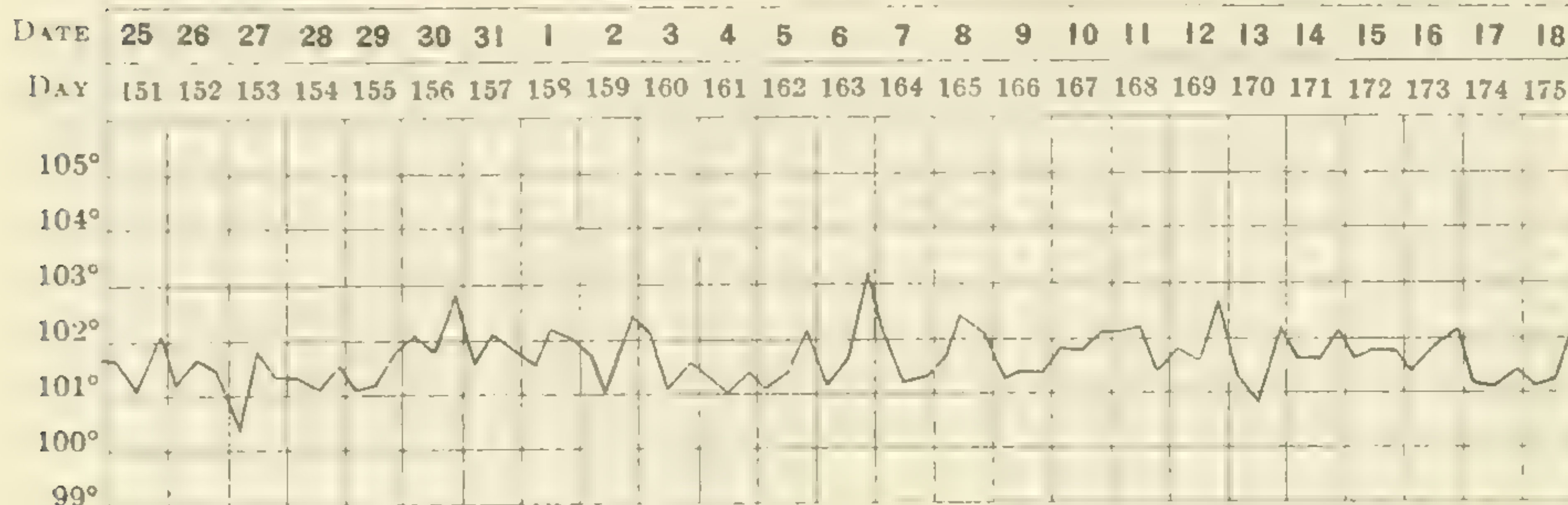
1908 SEPT.      OCTOBER



131 Only a very few parasites present, per smear.      Animal continually recumbent. Visible mucosa  
 134 Parasites, only a few in several smears.      and skin no longer yellow. Mucosa of eyes  
 136 Erythrocytes=6,700,000.      exhibits extreme anæmic condition.  
 139 Parasites still scarce.      147 Parasites still scarce.

# CHART E, Continued

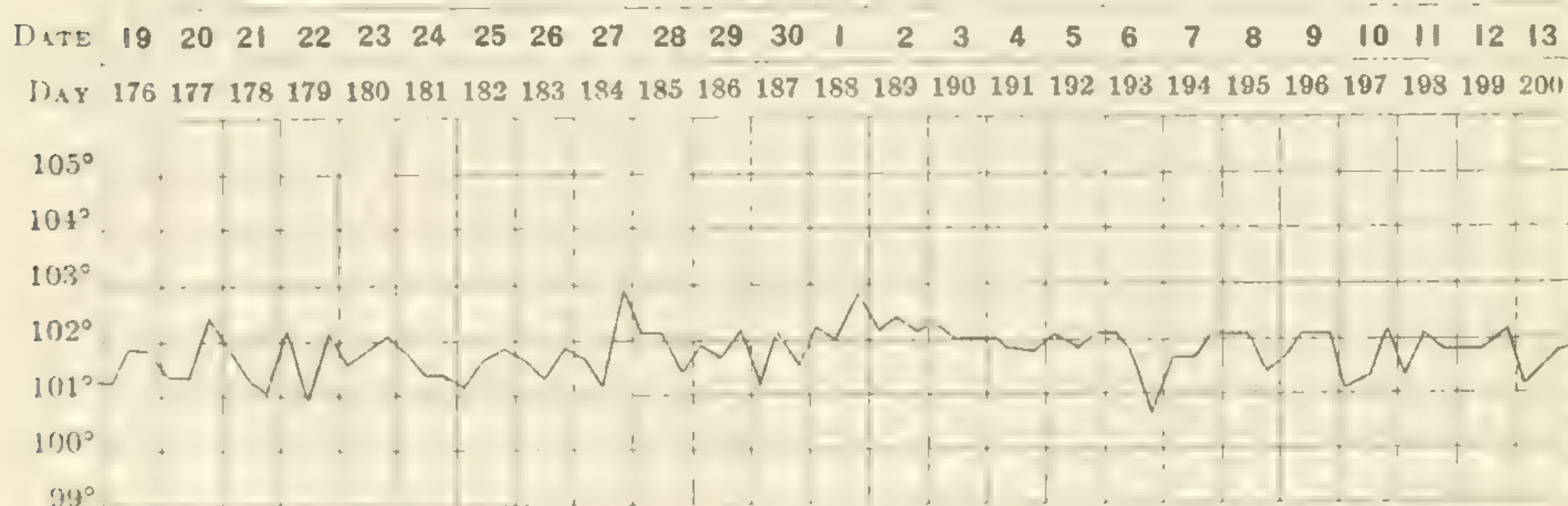
1908 OCTOBER      NOVEMBER



163 Parasites more plentiful.      167 Blood coagulated very slowly.  
 164 Sick and blowing slightly.      175 A few parasites observed.

# CHART E, Continued

1908 NOVEMBER      DECEMBER

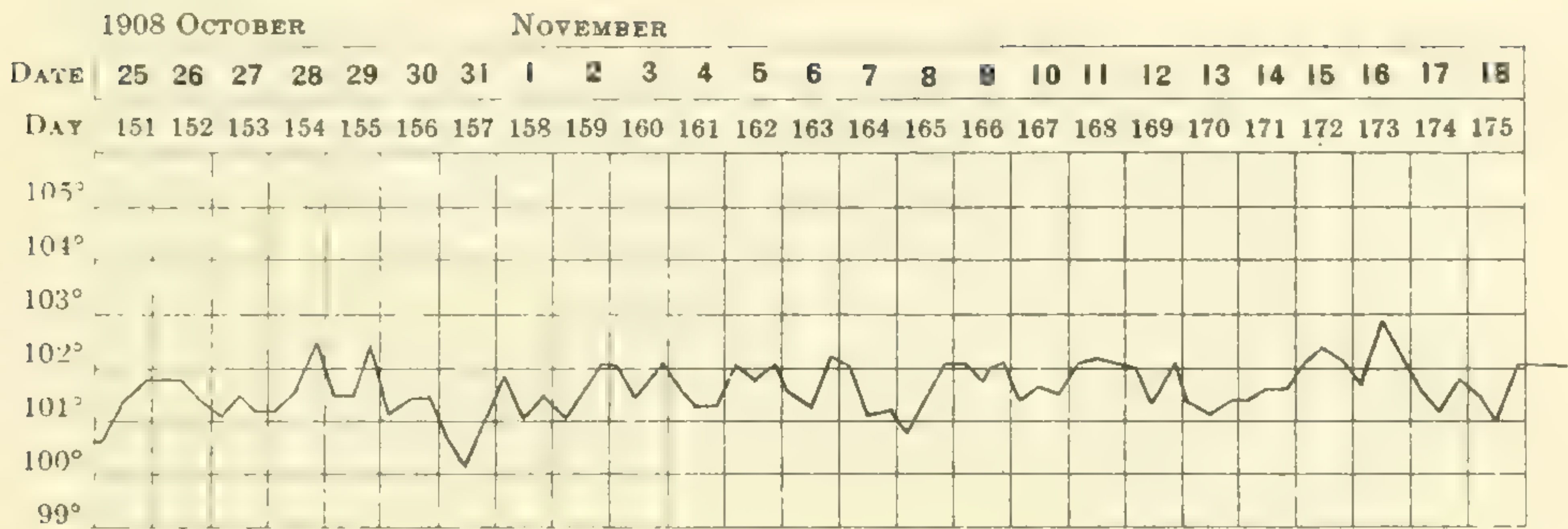


184 Placed 3 unfed adult females ticks on skin.  
 Ticks off and cloth destroyed in the morning.

The temperature up to April 30, 1909, showed practically no variation.  
 On February 9th, only two parasites appeared in several smears examined.  
 On March 31, 1909, erythrocytes 6,900,000 H=80.



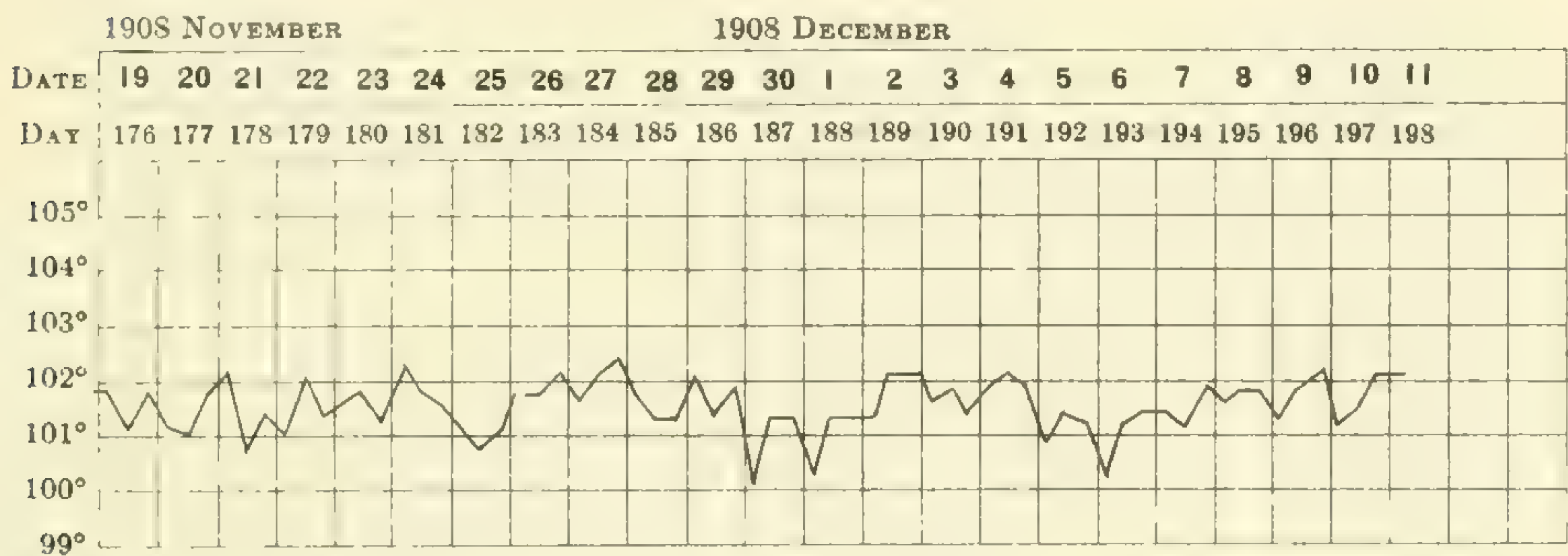
CHART F, Continued



155 Visible mucosa, especially the eye, show indications of an anæmic condition.

173 A few parasites per smear.

CHART F, Continued



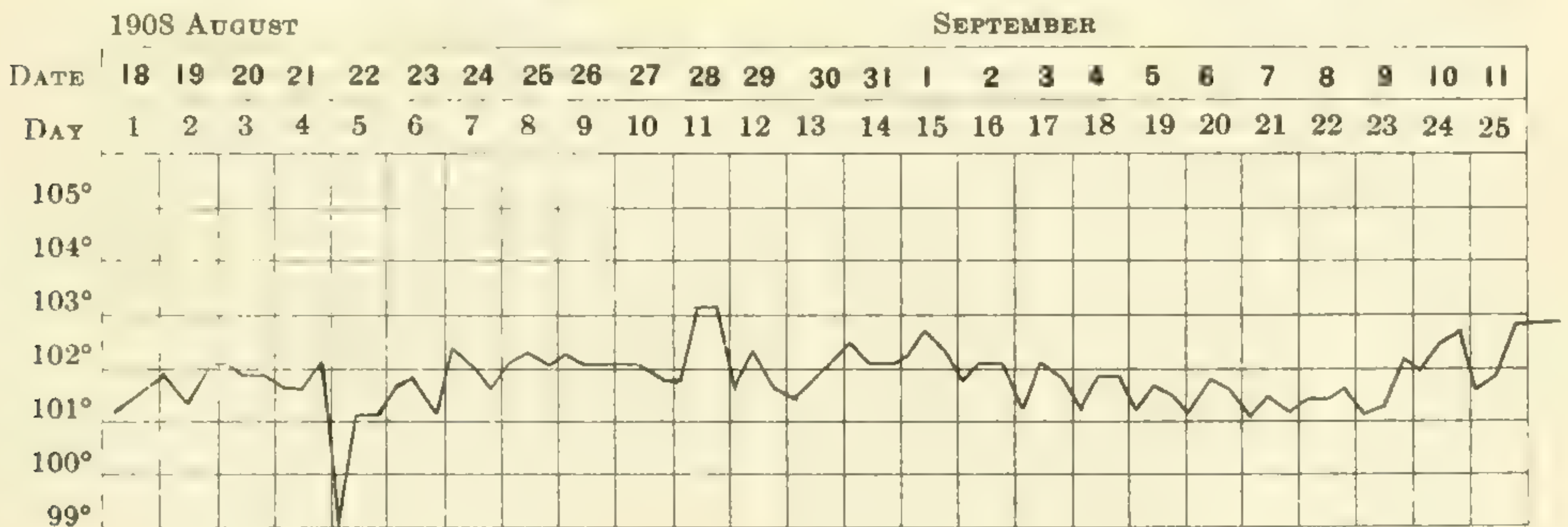
198 Sent to Mr Phillips' farm, Mount Lehman and bred for continuance of temperature there Vide Chart L.

RED WATER

CHART G

No. III. Kamloops heifer

Infecting material,—60 c.c.m. defibrinated blood from cow No. II, Mt. Lehman, (Taylor's). Subcutaneously Aug. 17, 1908.

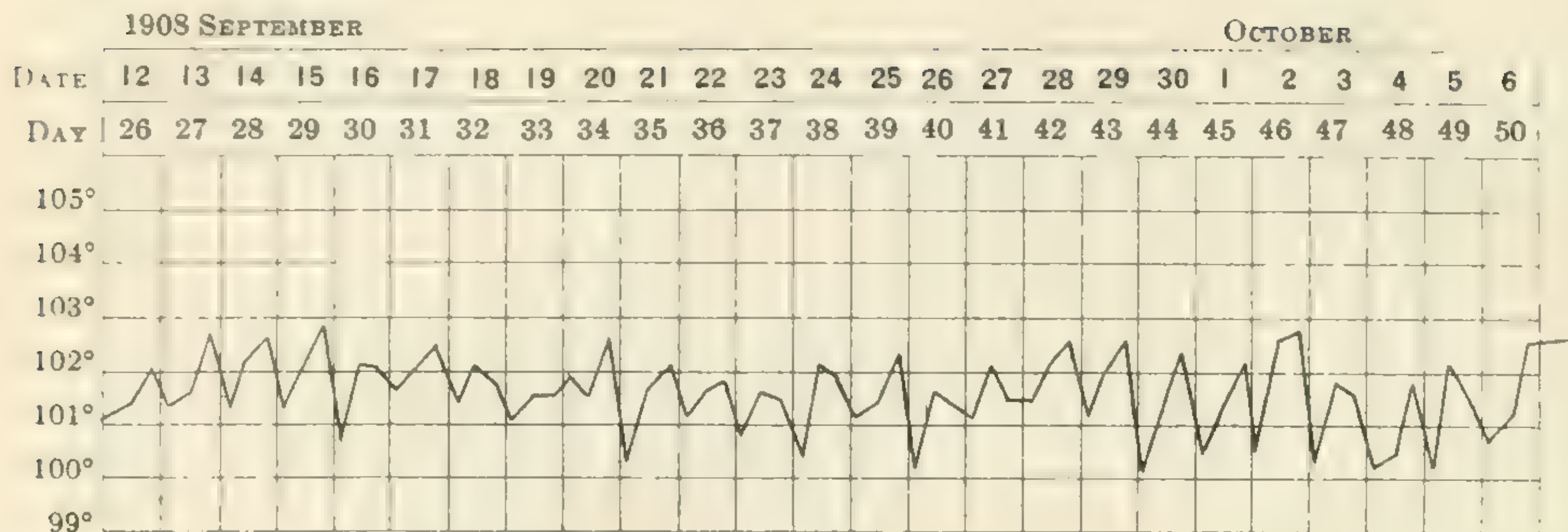


10 Erythrocytes=7,200,000.  
11 A few parasites observed.

15 Erythrocytes=6,400,000.  
17 Skin and visible mucosa becoming very yellow.



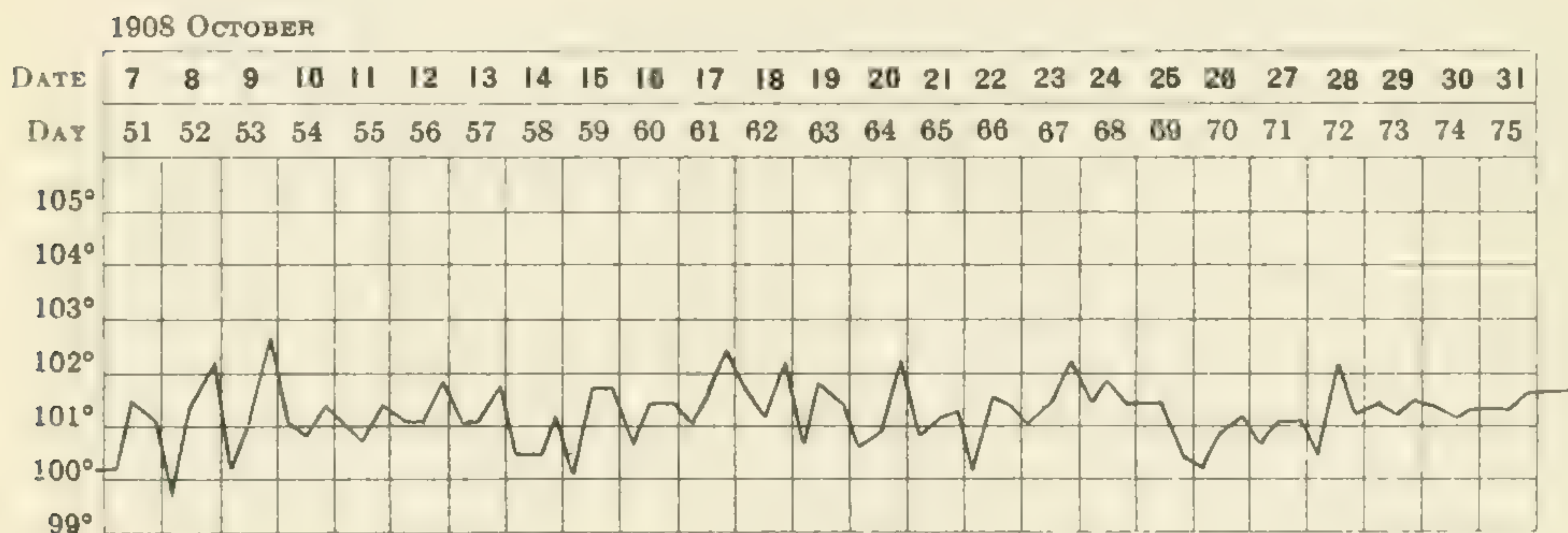
CHART G, Continued



30 Bled and blood centrifugation, no signs of trypanosomata.

31 Animal's condition improving.

CHART G, Continued

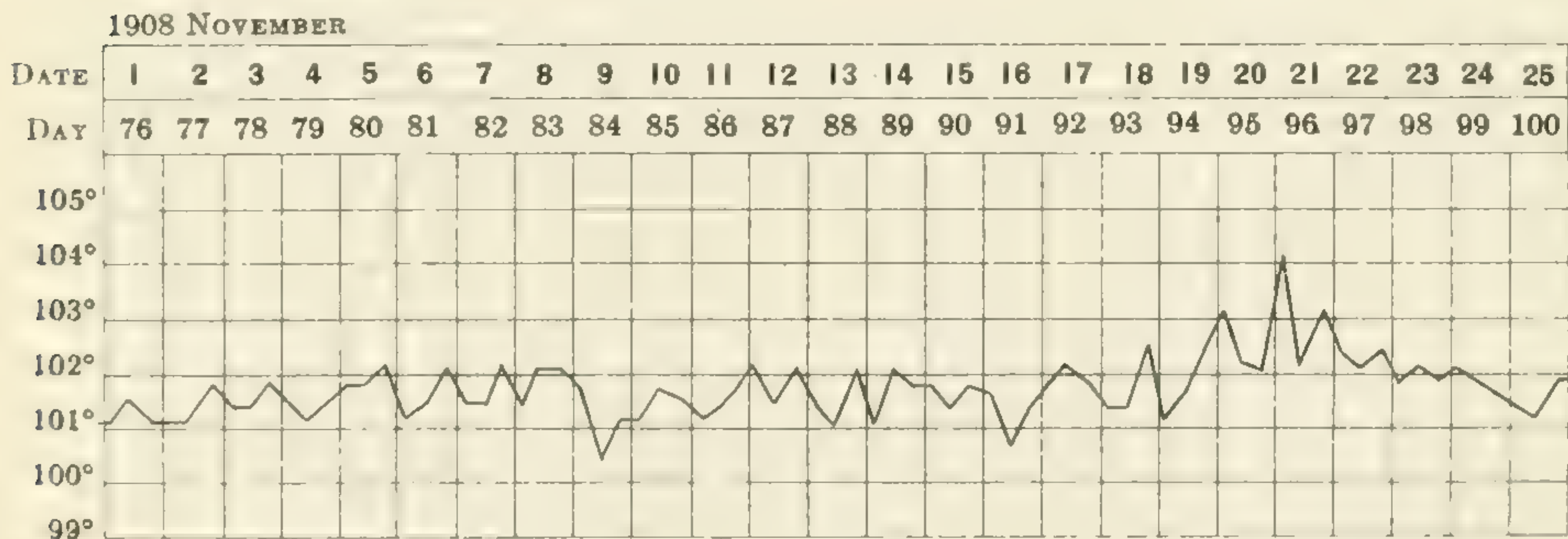


54 Erythrocytes=6,000,000.

54 A few parasites in blood smears.

Temperatures to April 30, 1909, show very little variation from normal.

CHART G, Continued

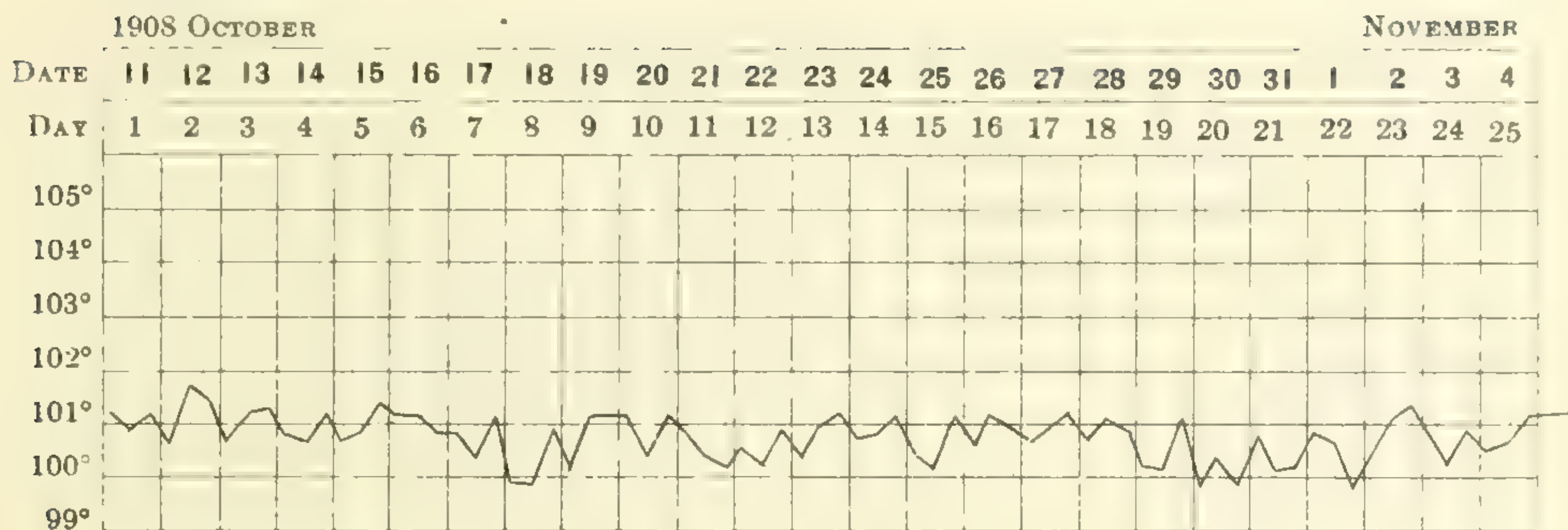


78 Skin no longer yellow. Mucosa of eye blanched. Anæmia pronounced.

95 A few parasites.

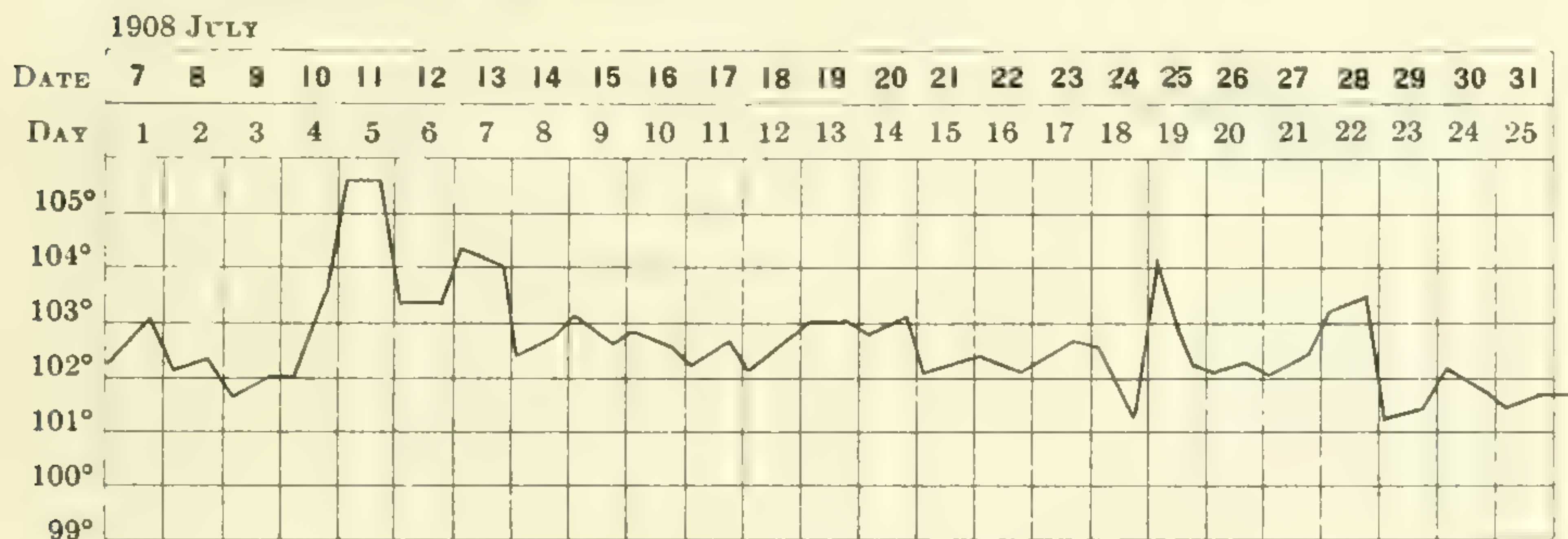


RED WATER  
CHART H  
No. IV. Kamloops heifer  
Control



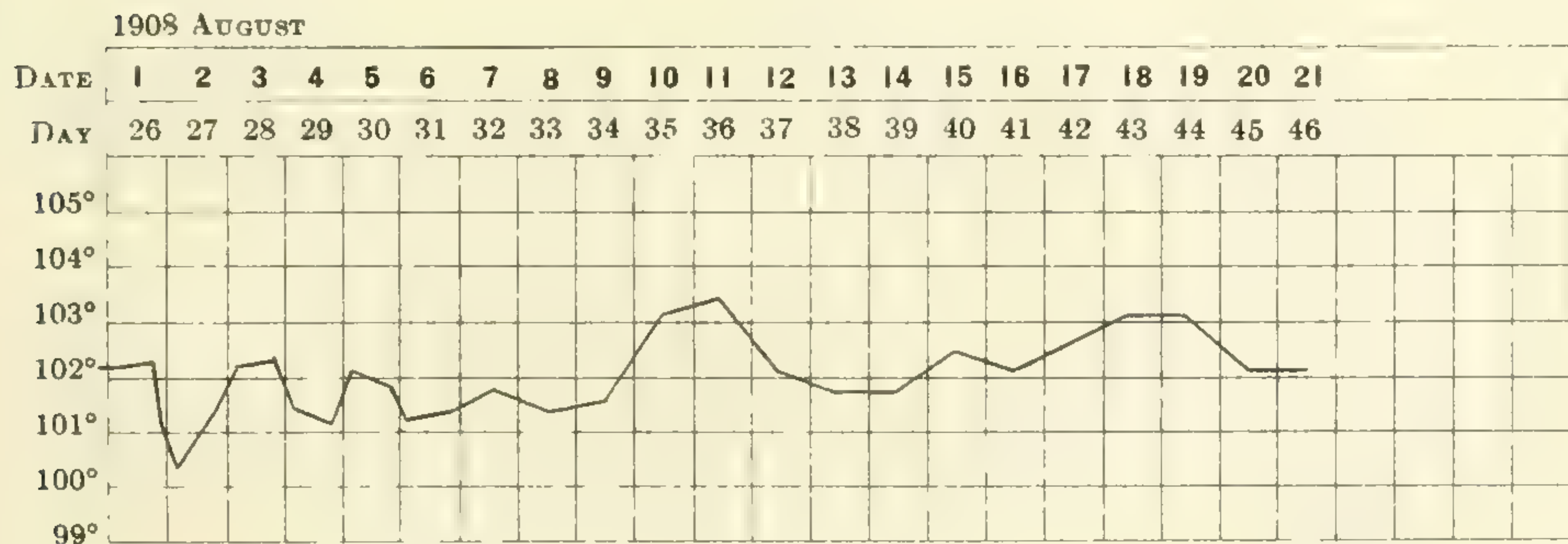
Temperatures to April 30, 1909, show very little variation from normal.

RED WATER  
CHART I  
Mare No. I.  
Infecting material,—2 c.c. m. blood & normal saline solution from ear of heifer No. II, injected into posterior articular vein, July 6th, 1908



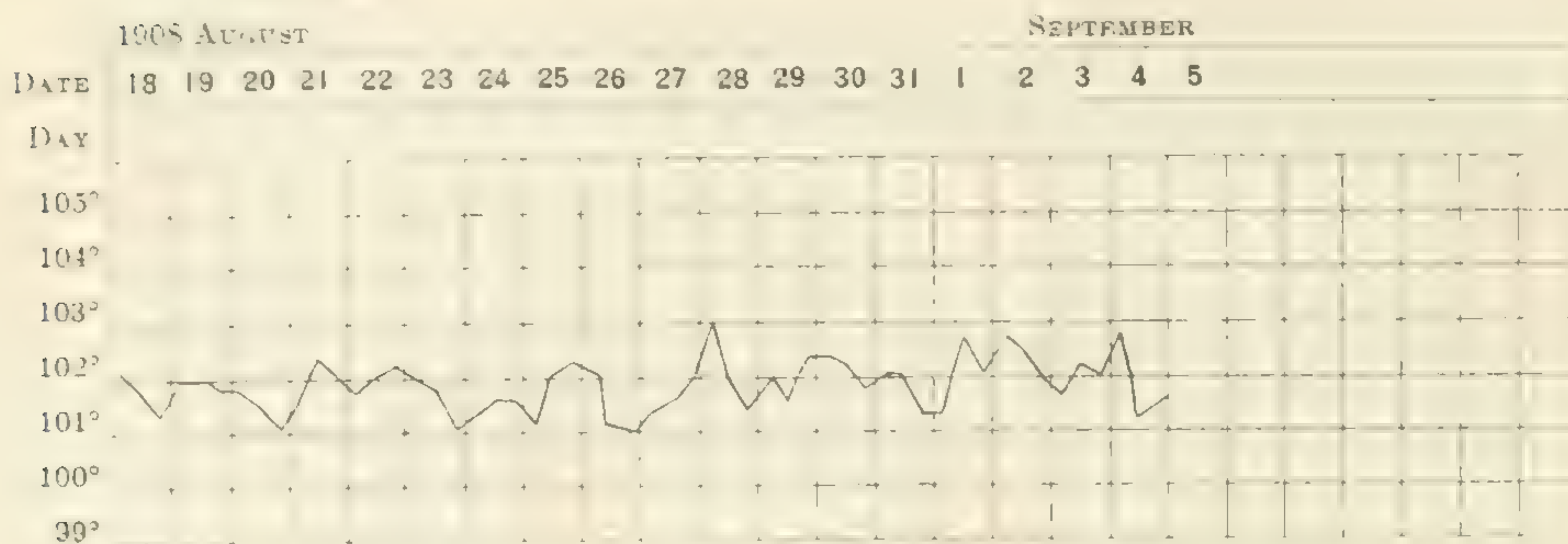
5 Found with a broken leg. Set same day

CHART I, Continued



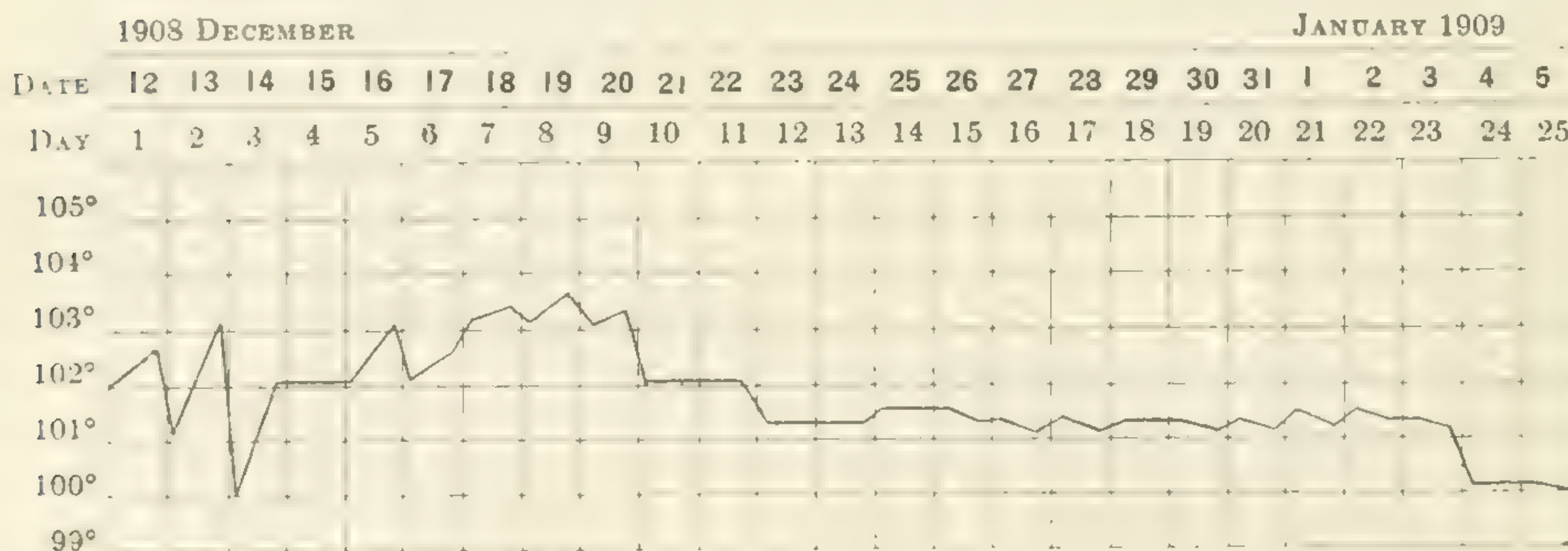


RED WATER  
CHART J  
Guinea Pig No. 2  
Infecting material,—2 c.c.m. defibrinated blood intraperitoneally from cow No. II, (Taylor's) Aug 17th, 1908.



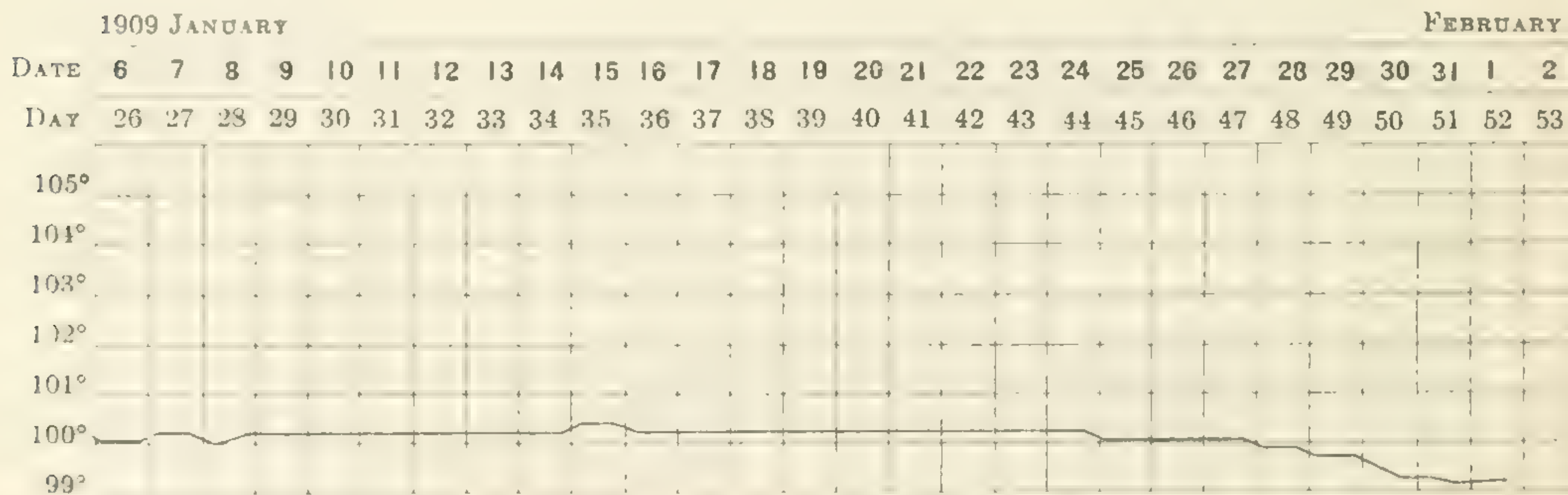
\*Found dead: post mortem 10.30 H.M.

RED WATER  
CHART K  
Bull No. I. (Mr. Phillips').  
Natural Infection. First attack early in spring of 1908.



Haemoglobinuria present—most of the time—great wasting of muscles of the loins.  
Treated medicinally with quinine and other tonics for about 8 months.

CHART K, Continued

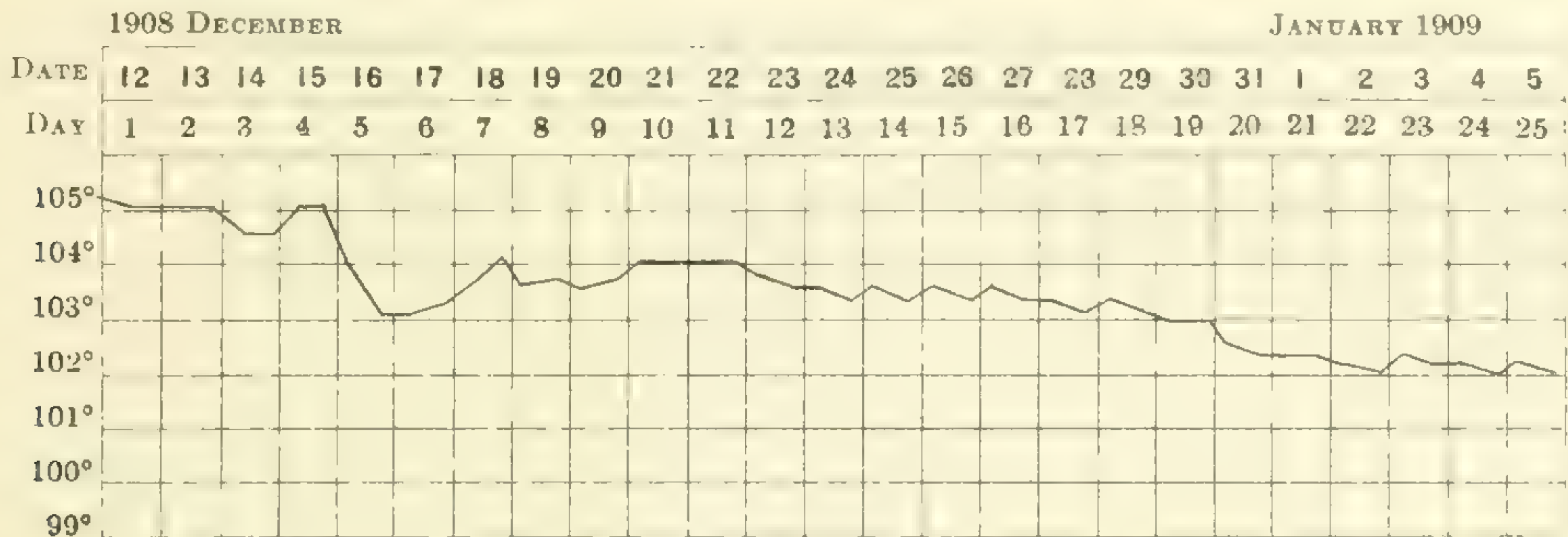


\*Shot, February 2, 1909, in extremis.



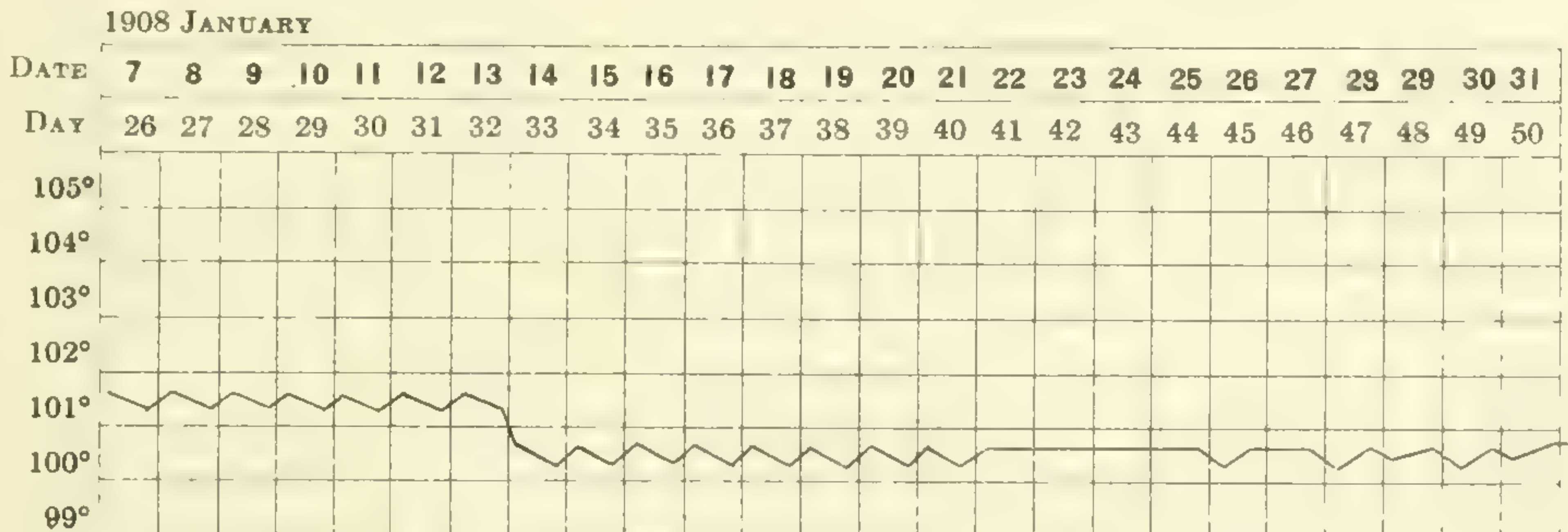
RED WATER  
CHART L  
Heifer No. II.\*

Infecting material,—Vide Chart F. Sent to Mr. Phillips' farm, Mt. Lehman, December 11th, 1908



\*Placed under natural conditions and in contact with an infected herd. Also bred. At present this heifer is in good condition and shows no signs of disease

CHART L, Continued



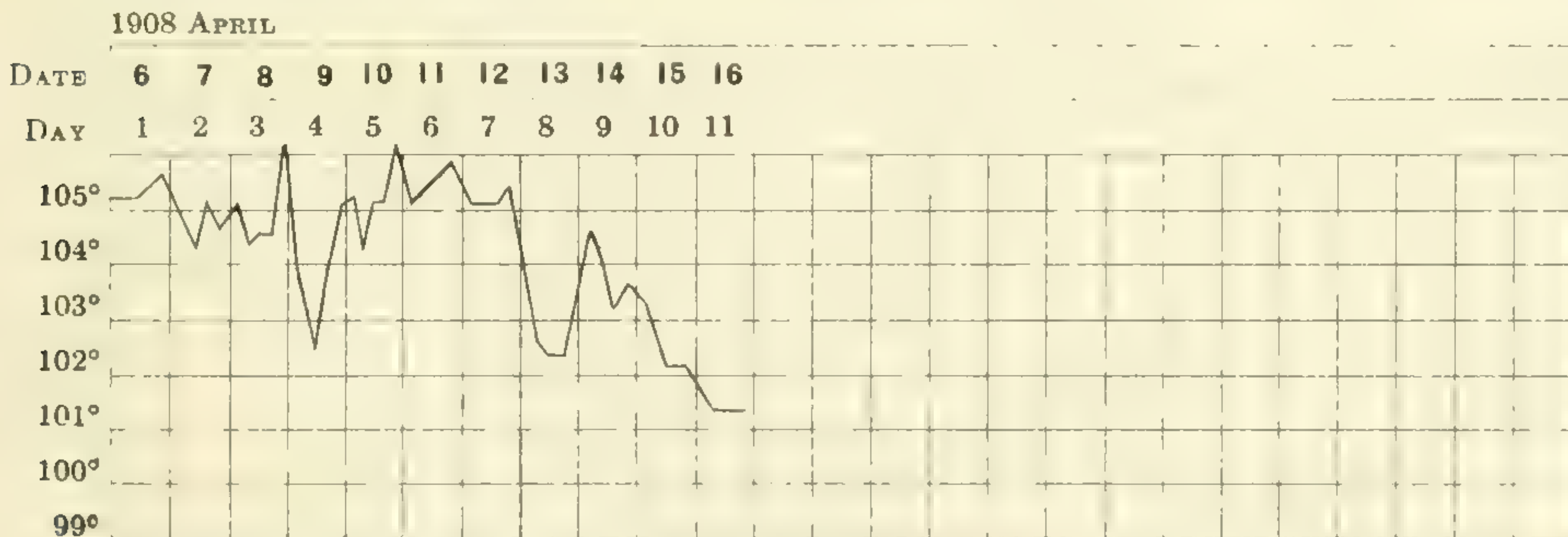
\*The variation during this month is according to the temperatures kept and forwarded by Mr. Phillips. February only showing a variation of about  $\cdot 1^{\circ}$ . An extended chart is not included.

Influenza (?)

CHART M

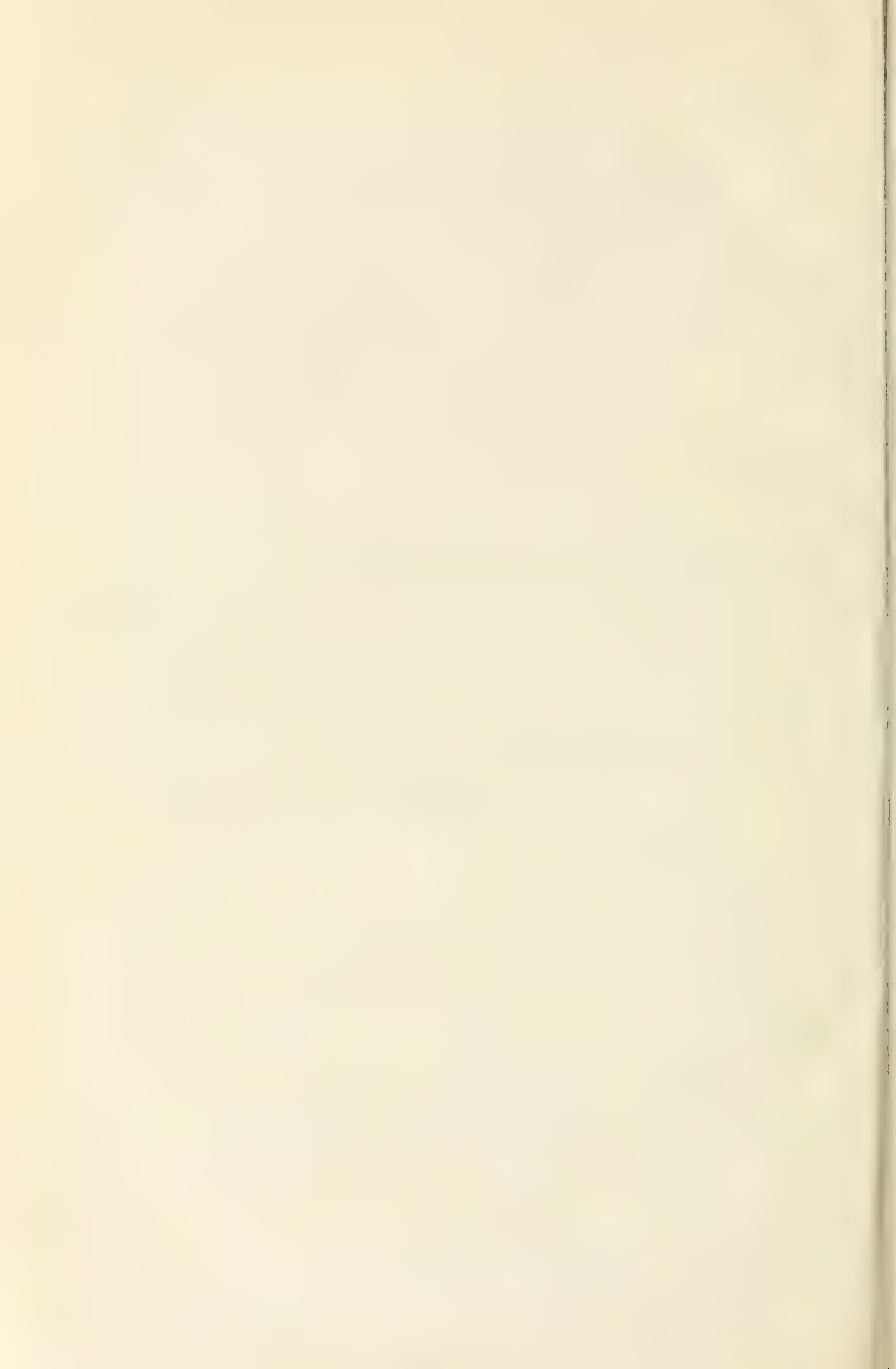
Horse No. 2.

Infecting material,—Secondary infection, associated with Icterus and the presence of Haemocytozoa in the Erythrocytes.



\*First day of observation until fifteenth day of illness.  
xRecovered.







SESSIONAL PAPER No. 15b

## APPENDIX No. 14.

W. H. PETHICK, V.S.

ANTIGONISH, March 31st, 1909.

SIR,—I have the honour to submit the following report for the year ending March 31st, 1909.

In several preceding reports I have dealt more or less fully with 'Pictou Cattle disease' and have given a detailed account of the experiments which I had the honour of conducting under your direction at the Station at Cloverville.

In order that the public might derive full benefit from the result of our work, you instructed me by letter, under date of March 10th, 1908, to deliver a series of lectures and addresses at as many points as possible in the ragwort infested districts of Nova Scotia and Prince Edward Island, the subject matter being:—The part played by ragwort in the causation of Pictou cattle disease; the advisability of securing as far as possible the extermination of the weed, and the means by which this may be most effectively accomplished.

I have now held fifty four public meetings at central points. These were well attended and much interest shown. I have visited hundreds of farms, many schools, attended and spoke at exhibitions, Municipal, Town Council and Board of Trade meetings, the agricultural college, dairy school, seed fairs, agricultural picnics and other public gatherings and may say, have taken advantage of every opportunity of meeting the people and discussing fully the practical methods of getting rid of the pest. To this end I have advised a shorter rotation of crops than is usually practiced in Eastern Nova Scotia, more thorough cultivation, the more frequent use of weed destroying implements, the importance of cutting the weeds before the seed forms on the highway, in fence corners and headlands.

As we have now ample proof that sheep may be profitably employed in clearing ragwort infested land and will do the work more thoroughly than by the means already suggested, I have strongly advised the running of larger flocks on the hill-sides, rocky pastures and wasteland.

The special report issued by your department, as also circulars dealing with the subject, have been freely distributed by mail and at meetings, and many letters have been written to people who could not well be reached otherwise.

I take this opportunity of acknowledging the valuable assistance rendered by the Clergy, The Chief Superintendent, Inspectors and Teachers in the educational service, the officers and staff of the Agricultural College, the Superintendent and Officers of Farmers' Institutes, the Physicians practising within the ragwort area and the Press. These and many other public spirited people have done much good both by precept and example. I wish also to express my admiration of the work done by the Womens' Council of East Pictou, and to thank these ladies for their hearty co-operation.

I am glad to be able to inform you that much progress is being made all along the line. In many sections the weed has already been successfully fought and I have every reason to believe that a still more vigorous campaign will be conducted next summer, and that the ragwort will be brought under control in many other sections.

Perhaps the strongest proof that the suggestions which we have been able to offer, as a result of the knowledge gained by our experiments, and also that the object for which the station was established has been gained, is the fact that there is a very marked decrease in the number of cases of Pictou cattle disease as compared with former years.



1 GEORGE V., A. 1911

You will be pleased to learn that in several sections, where a few years ago the disease was prevalent, not a case is reported during the past season. I have favourable reports from every district; as an example:—Rev. D. L. Macdonald of Arisaig informs me that, so far as he can learn, not more than eight deaths from Pictou cattle disease occurred in his parish during the year. I need only add that a few years ago this would not be considered a high mortality for one month in summer, in the same district. This, together with satisfactory reports from other reliable and well informed gentlemen in other localities, is certainly most encouraging.

The arrival in early June of a car-load of pure bred rams from Ontario in charge of Mr. Scott, a capable sheep man, afforded me the opportunity I had long wished for of demonstrating to our many visitors the beneficial effect upon sheep of kindness, careful management, generous feeding, change of pasture, value of rape, turnips, etc., as well as the importance of dipping, trimming, docking and the castration of market lambs. These subjects are dealt ably with by Mr. Spencer in bulletin No. 12, which I hope will be carefully read by our sheep owners.

As Mr. Spencer was fortunately able to be present and personally direct the auction sales of the rams referred to, and has no doubt reported fully, further comment by me is uncalled for. I would, however, state that the introduction of these high class sheep will, by increasing the profits of the flocks, do much to encourage the sheep industry within the weed area.

In addition to the work referred to, my services have been utilized as heretofore in connection with reported outbreaks of contagious diseases. Such matters were promptly and carefully investigated and already reported upon.

The existence of foot and mouth disease in several of the United States made it necessary for me to devote considerable time to the enforcement of the regulations and prohibitive orders. I have from time to time sent you detailed accounts of my visits to different ports, and of my work in this connection.

#### PORT INSPECTIONS.

You will have noticed by the reports which I have had the honour of sending you monthly, that the number of animals inspected by me, before shipment to Newfoundland, were as follows:—

From Mulgrave, 33 horses, 495 cattle and 404 sheep.

From Bayfield, 20 horses, 259 cattle and 76 sheep. I have also applied the tuberculin test to an animal for export to the United States. All were healthy and in fit condition, and I may state that all classes of live stock were remarkably free from disease during the year.

In conclusion, I might mention the existence on certain farms on Cape Breton Island, of 'Nodule disease' in sheep, caused by '*œsophagostoma columbianum*.' In investigating the conditions existing on certain farms where the disease was most troublesome, I found that while the flocks were, as a rule, well cared for, the grass and hay upon which they fed was badly infested with the 'cottony grass scale' (*criopeltistucæ*). As the feeding upon such dry and innutritious grass containing the cottony egg sacs would certainly lower the vitality of the animals and lessen their resistance to worm disease, I recommended that an effort be made to destroy the scale, by burning over the pasture and meadows in the fall or early spring. I also gave as full information as possible concerning the methods of raising a flock, free from the parasites.

I have the honour to be,

Sir,

Your obedient servant,

W. H. PETHICK,

*Inspector.*

To The Veterinary Director General,  
Ottawa.



SESSIONAL PAPER No. 15b

## APPENDIX No. 15.

J. J. McHUGH.

OTTAWA, January 4, 1909.

SIR,—In accordance with your instructions of May 16th, 1908, I have made a careful investigation of conditions prevailing in the shipment of cattle from Canada and United States to British markets. I visited Montreal, Boston, Portland, New York, Philadelphia and Baltimore in order to institute a comparison between American and Canadian methods in the transportation of cattle, by rail and boat. To the same end, I crossed the Atlantic six times on cattle boats of different lines, both American and Canadian, viz.:—ss. *Athenia* (Donaldson); ss. *Ionian* (Allan); ss. *Iona* (Thompson); ss. *Haverford* (American); ss. *Monmouth* (C.P.R.).

I have also made a careful note of conditions prevailing in British ports and markets, visiting Liverpool, Glasgow, Deptford, Manchester, Bristol, Cardiff, Smithfield, and numerous other important places.

Many of these visits were made in your company and you are therefore personally familiar with the conditions described as well as with most of the other matters dealt with in this report.

The results of my observations are embodied in this report accompanied by certain suggestions, which if carried out, will, I think, greatly improve our Canadian cattle trade.

All of which is respectfully submitted.

## CONDITIONS ON CANADIAN CATTLE BOATS.

## (1).—TEMPERATURE AND VENTILATION.

*In summer.*—From my observation on a number of cattleships leaving the port of Montreal, I judge that the temperature conditions in Summer are generally fair. There is, however, no doubt that they could be improved by increased ventilation, as at present the average temperature for a considerable portion of the voyage is frequently between 70 and 80 degrees on the lower decks. Of course, the temperature varies with the number of cattle placed on each deck,—the fewer the cattle, the more comfortable the temperature. On the upper deck, the cattle enjoy plenty of fresh air, but at times suffer considerably from the heat of the sun.

*In the other seasons* the temperature on the lower deck is comfortable, but by no means so on the upper deck. I would suggest that under no consideration cattle be allowed on the top deck of any ship (if the said deck is not covered) between the 15th. of October and the 15th of May, as they suffer to no small extent from the cold air and spray. As an instance of this, I may say that I saw cattle unloaded at Deptford on October 18th, 1908, and those which came off the upper deck could be easily distinguished from the others, by the roughness of their hair, and their gauntness, due to the usage they had received there. I should estimate their shrinkage at about 2½ per cent greater than that of the cattle below them, though they were all of the same grade and condition when leaving port.

## (2).—COMFORT IN THE STALLS.

The regulation space for each animal is at present 8 feet long by 2 feet 8 inches wide, which I consider insufficient. The present width is adequate when the cattle



1 GEORGE V., A. 1911

are standing up, but inadequate when they lie down. The present length is sufficient for the average animal, but not so for long and rangy cattle, and heavy bulls. For instance on the ss. *Ionian*, Allan Line, on July 10, 1908, I saw a shipment of cattle. The fittings were put in temporarily for the trip, but of regulation size, and I noticed that some of the larger cattle were touching at both ends and were very uncomfortable all through the voyage. I would, therefore, recommend that the regulation space be increased to 8 feet 6 inches in length and 2 feet 10 inches in width for export cattle. On the floors of all the stalls of these ships, there are four cross-pieces, three of which seem to me to be not merely useless but even injurious to the cattle. There is not generally sufficient bedding to completely cover these cross-pieces, and consequently when the cattle lie down on these more or less sharp-edged timbers they are extremely uncomfortable. As a rule, the manure is not removed and the bedding when spread is gradually worked by the moving of the cattle until their hind legs are considerably higher than their fore legs, and the latter are resting on the cross-pieces when the cattle lie down. Moreover, owing to the manure and bedding not being spread evenly, and owing also to the insufficiency of the bedding, the stalls become very filthy; hence it frequently happens that from one or another of these causes the animals remain standing until forced to lie down through fatigue.

The above mentioned cross-pieces may have been required in the older ships, which were slower, more unsteady and of a smaller capacity, but in the modern ships, the cattle would be sufficiently braced against rolling by the back cross-piece being moved a foot forward, as they could then prop their hind feet against this and their fore feet against the trough. By doing away with the other cross-pieces, if there should be insufficient bedding, the cattle would not be in such discomfort.

### (3)—FACILITIES FOR FEEDING AND WATERING.

These are by no means up to date on the Montreal ships. They consist of puncheons and large barrels filled with water by hose; the water is then carried to the cattle in pails, out of which they drink. The manner of feeding the hay is as satisfactory as possible. On many of the ships the troughs are more or less in bad repair, with the result that much of the corn is scattered and wasted.

### (4.)—SHRINKAGE.

Owing to these conditions, the shrinkage of cattle on the ocean voyage is very considerable, amounting on an average to 50 to 60 pounds per bullock, and in some cases of wild ranch cattle the shrinkage is double this amount.

In your memorandum of May 16th you request me to institute a comparison between these ships and the best equipped cattle-boats crossing the Atlantic; as the time allowed for my investigations extended merely from June till November, and as a great deal of that time was spent in inspecting cattle-markets, stock-yards and abattoirs on both sides of the Atlantic, I was able to observe conditions on only two thoroughly well-equipped American cattle boats.

The first of these was the ss. *Ulstermore* of the Johnston Line, sailing from Baltimore to Liverpool. I saw this ship in the latter port. She has only two decks for cattle. Each deck contains four rows of cattle running the length of the ship. Between the rows, there is a passage 6 feet wide. The floor is of concrete, grooved, to prevent slipping, besides the regulation cross-pieces. The space for each animal is 8 feet in length, 2 feet 8 inches in width; but in addition to this, there is a space of 18 inches behind the cattle for cleaning purposes, and numerous port-holes for the same. The troughs are of concrete. The ventilation is good and all parts of the ship are equipped with sufficient electric light.

The second ship which I had the opportunity of inspecting was the ss. *Haverford* of the American Line. I sailed on her from Philadelphia to Liverpool on



## SESSIONAL PAPER No. 15b

September 20th, 1908. Her capacity is 830 head of cattle, but on that voyage she only carried 630. This ship has practically the same space and equipments as the *Ulstermore* except that the water is supplied by hose, instead of by pail. I was present at the loading and unloading of the cattle on the ss. *Haverford* and in my opinion as well as that of the cattle foreman, there was no shrinkage. Of course, those cattle were all dehorned, grain fed, and domesticated; and when tied up and fed, acted like cattle eating in their barns.

## (5.)—SHRINKAGE OF VARIOUS CLASSES OF ANIMALS.

1st. *Summer and Autumn*.—Shipped grass-fed medium fat cattle shrink 40 to 45 pounds per bullock on an ordinary voyage with good handling; on a rough voyage the shrinkage would be 70 to 75 pounds.

2nd. *Winter and Spring*.—Shipped hay-fed medium fat cattle shrink from 25 to 35 pounds per bullock on an ordinary voyage, with good handling; on a rough voyage 50 to 60 pounds.

3rd. *Summer and Autumn*.—Shipped grain-fed medium fat cattle being domesticated, shrink only 15 to 20 pounds per bullock on an ordinary voyage, with good handling; on a rough voyage 30 to 40 pounds.

4th. *Winter and Spring*.—Shipped grain-fed medium fat cattle shrink 30 to 40 pounds with good handling.

5th. Well-finished grain-fed cattle, shipped at all seasons of the year, shrink a little more than the above figures, owing to their superfluity of flesh; in distillery-fed cattle, the shrinkage is double that of the hard-grain-fed cattle.

The above figures apply only to eastern domesticated cattle. In the case of western cattle, both domesticated and ranchers (and particularly the latter) the limit of shrinkage has almost been reached during the transit by rail; of which I shall again make mention in this report.

## COMPETITION WITH CATTLE AND DRESSED MEAT FROM OTHER COUNTRIES.

Our Canadian cattle have to compete with the following: English, Irish and Scotch well-finished live stock; American well-finished live stock; American chilled meat, Argentine and New Zealand chilled and frozen meat.

The following are the prices these various classes fetch in the English markets. As there is a certain amount of fluctuation, I have thought it advisable to quote prices in two or three of the principal markets, during the period extending from July to November.

*Smithfield Market Quotations.*

July 8, 1908—For dressed beef per 8 lbs. Sinking the offal—

Killed, States sides 3/9 to 4/1. Ex. 4/2.

Killed, Canadians, 3/8 to 4/. Ex. 4/1.

July 15, 1908—

Killed, States sides, 4/4 to 4/8 per 8 lbs. Sinking the offal.

Canadians, 4/2 to 4/8.

July 22, 1908—

States, 4/4 to 4/8 per 8 lbs.

Ranchers, 3/11 to 4/2 per 8 lbs.

States, 4/4 to 4/8. Exceptional 4/10.

July 29, 1908—

States, 4/8 to 4/9. Seconds, 4/5 to 4/7.

Canadian, 4/4 to 4/8.

NOTE.—The above are the top prices.







## SESSIONAL PAPER No. 15b

October 17, 1908—

Deptford States (940), 4/4 to 4/6.

Canadian (87), 3/9 to 4/3.

Ranchers (300), 3/6 to 3/11.

Westerns (200), 3/ to 3/6.

November 18, 1908—

Deptford killed, States sides, 3/4 to 3/9.

“ Canadian, 3/2 to 3/6.

“ Rancho, 2/9 to 3/2.

States chilled beef hinds, 3/6 to 4/6.

“ “ fores 2/4 to 2/6.

Argentine hinds, 2/2 to 2/6.

“ fores, 2/1 to 2/.

“ frozen hinds, 2/6.

“ frozen fores, 2/2.

It will thus be seen that at present the best States fresh-killed beef fetches from  $\frac{1}{4}$  of a cent to one cent per pound more than the best Canadian beef.

Best New Zealand frozen beef sells a fraction over  $7\frac{1}{2}$  cents per pound in quantities of not less than 25 quarters.

Best Argentine frozen beef sells at  $7\frac{1}{2}$  cents per pound in the same quantities.

Best American chilled beef sells at  $9\frac{1}{4}$  cents a pound in the same quantities.

Best English, Irish and Scotch fresh-killed beef fetches about a cent per pound more than the best American fresh-killed beef in the same quantities.

## TRANSPORTATION OF CATTLE ON RAILROADS.

*Canadian cattle cars.*—The Canadian cattle cars though somewhat improved during the last few years are still sadly deficient in many respects; in the first place, the livestock cars are too narrow, and are used for other purposes at certain seasons of the year, such as carrying emigrants' effects and general merchandise, with the result that when the cars are used for the transportation of live-stock, notwithstanding the supervision of the car-examiners, bolts and heads of nails are frequently left projecting, and cause considerable damage to the cattle.

Again, a number of cars are equipped with hay-racks, the capacity of which is barely sufficient for one feed, and as it is impossible to replenish them while the cattle are in transit, the latter suffer very much from lack of feed until they are unloaded at the various stopping places. There are no appliances for watering cattle on any of the cars, and as the feeding and resting places are far apart, it sometimes happens that the stock remains two and three days without feed and water. Where there are no hay-racks in the cars, the hay is scattered over the floor, and of course, in a very short time becomes filthy and unfit for use, from the shuffling and drop from the cattle.

The door-ways on all the C.P.Ry. cars are in the centre and have square edges, which is damaging in the loading and unloading of cattle, as they crowd from both ends towards the centre, and get jammed in the doorway; the point of the hip being frequently bruised.

Moreover, very frequently, the speed of the train is retarded by the over-tonnage caused by picking up at various points, additional cars of dead freight, such as wheat and special merchandise, thus keeping the cattle in transit many hours longer than they should be. I have, personally, accompanied cattle on trains in cold weather when the engines went dead, and left the train of live-stock standing for hours until another engine could be secured. I might mention a case which occurred to my own stock in November, 1906. I loaded 7 cars of cattle at Cayley, Alta., on Sunday the 25th of November. There was some delay before getting the train-load



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complete at Gleichen. Another delay at Medicine Hat owing to the engine and crew not being in readiness. At Swift Current, they put on 6 cars of wheat which overloaded us. The Conductor had orders for a '25-miles-an-hour run,' but at no time did he make that speed. We did not rest or feed at Moosejaw. We rested 24 hours at Winnipeg, but after reloading, were held 5 hours longer in very cold weather, owing to the engine and crew not being in readiness. At Winnipeg, 3 additional cars of dead freight (offal) were attached to our train in place of 3 cars of D. P. McDonald's cattle which were left standing on the side-track for 18 hours in open cars. I may mention that those 3 cars of offal were consigned by Gordon and Ironsides to Liverpool, and were to sail with our cattle on the ss. *Sachem* from Boston. McDonald's cattle did not overtake us till we were in Montreal, and then only a few hours before we pulled out for Boston, much the worse for the usage they had received. I may also mention that two of our best steers, branded 'II 2,' were stolen from the Winnipeg stock-yards, while we were resting there.

This is but one example of the many delays which occur in the transit of cattle from Western points. As a result of these unsatisfactory conditions, the cattle arrive at the port of embarkation in a bruised, tired, dirty and emaciated state, and far less fit to stand an ocean voyage than they would otherwise be. I should consider the shrinkage of the train-load of cattle above mentioned, to be at least 100 pounds per head; of course, they are grass-fed range cattle.

I know of a shipment of Gordon and Ironsides in which 3 of the cattle were so much injured during the railway journey that they died on board ship. In general terms, I should estimate the proportion of range cattle more or less injured by bruises, during railway transit, to be about 5 to 6 per cent. In my opinion more care should be taken by all conductors of cattle trains, in shunting, starting and stopping, to avoid unnecessary jolting and bruising.

Some Canadian shippers hold that the closer the cattle are packed in the cars the less danger there is of bruising; such however, is not my opinion. I consider that when cattle are crowded, should any fall or lie down there is less possibility of their rising. The stock-cars at present in use, should not contain more than 16 or 17 export animals.

In a word, our present Railway facilities are of the crudest. Live animals, fattened at considerable expense, are treated with scarcely greater consideration than lumber or wheat.

#### AMERICAN CATTLE-CARS.

The American cattle-cars are superior in every way to ours. They are longer and wider, and generally have facilities for feeding and watering cattle in transit. On September 10th, 1908, at Boston, I inspected the unloading of a shipment of cattle from the trains into the ss. *Georgian*. The cars were marked 'Swifts' Live Stock Express, Special Stock-Cars. They were 36 feet long and 8½ feet wide. All the doors were on the end side of the cars and were in halves; the under half swinging down on hinges to form a platform to the landing; the upper half sliding back. This, I consider a great advantage, as the ordinary gang-way which we use is very massive, and requires the service of two men to push it in place at the door of each car. The door-jambs were bevelled instead of having sharp edges like our cars. On the top of each car, there were one or two covered boxes containing 200 pounds or more of pressed hay. The roof of the cars was cut along the edges on both sides to form 3 feet hinged lids running the whole length of the car, by which the hay may be distributed from the boxes to the racks below. Inside the cars in addition to the racks there were troughs for water and chop running the whole length of each. These were of galvanized iron and could be turned up on a hinge against the side of the car when not in use.



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Some of the cars marked 'American Live Stock Transportation' had similar conveniences, except that the door was in the centre of the car. I am informed that on the Great Northern railway, and the Northern Pacific railway, Street's stable cars are generally used, which are invariably equipped similarly to those described above, and so enable the cattle to be fed and watered as often as necessary, en route, thus preventing the animals from being starved between the various feeding points. The cattle are loaded in these cars under careful supervision, and no overcrowding is permitted; as I mentioned above, 17 is generally the maximum number of cattle per car. Moreover, the cattlemen are nearly always regular salaried employees of the shippers, thus preventing ill-treatment, and a foreman accompanies each train load of cattle to seaport. There, they are handed over to another cattle foreman, a regular employee of the shipper, who is accustomed to sea voyages, and the care of cattle. Thus the shrinkage and mortality are reduced to a minimum.

Again, the speed of the American live stock trains is nearly double that of ours; consequently, the cattle are not kept nearly so long in transit.

There can be no doubt that cattle carried on these cars arrive at the port of embarkation with very little shrinkage, and are altogether, cleaner, fresher and in much better condition to stand the voyage. Of course, these cattle do not arrive directly from the range, but have been domesticated, dehorned and corn fed, in the middle states, for a period of 70 to 90 days, before being shipped to seaport.

## THE EMBARGO.

In answer to your query *re* comparative prices under existing conditions of American and Canadian cattle, allow me to refer you to another page of this report.

If the embargo were removed from both American and Canadian cattle, they would when well-finished command the same price. Of course, owing to the Americans' superior shipping facilities, our cattle would require a much longer time to finish, thereby entailing extra expenditure.

With regard to comparative prices of American and Canadian cattle, if the embargo were removed from the Canadians and left on the Americans, I should say that our cattle, after being well-finished on the other side, would command the same prices as those of the English, Irish and Scotch best beef.

## PROBABLE EFFECT OF REMOVAL OR EXTENSION OF EMBARGO.

If the embargo were removed from Canadian cattle, there would probably be a considerable increase in the trade, as a number of small shippers would then export long yearlings and two-year-olds. This would no doubt be of advantage to these shippers, but not to the country in general.

Hay and grain are much cheaper in Manitoba, Alberta and Saskatchewan, and consequently a bullock can be finished there at less than half the cost in Great Britain. Hence, in my opinion, Canadian shippers in general would find it more profitable to finish their cattle here, and so much more money be left in the country.

To the large exporters who have their cattle well-finished, the removal of the embargo would not be of any great advantage, but it would be advantageous to those whose cattle arrive in somewhat poor condition.

The yarding facilities would have to be materially increased to give space to cattle landing from the ranches and other places, in a bruised and emaciated condition, for the purpose of finishing and obtaining a better market. Of course, the bulk of these cattle would remain only a short time in lairage before going to their feeding places, as for instance, young stockers which would be taken away almost immediately on landing. There is no reason, except the expense involved, why the lairage owners should not provide increased accommodation.



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## EXTENSION OF THE LIMIT.

There is an agitation to have the embargo, if it be not altogether removed, extended to 30 days or longer. I would advocate an extension to 40 days which would be a great boon to all shippers of export cattle. Under the present system, a great many of our cattle land in Great Britain, as I said before, in a very inferior and shrunken condition, due mainly to the railway journey and ocean voyage. Ten days is not sufficient length of time for them to recover and be in fit condition for the market; an extra 30 days would do much to rest the cattle and freshen them before selling, more especially the domesticated stable-fed stock. Moreover, this extension of time would enable the exporter to receive the top market price for his cattle during that period. As you are no doubt aware, it occasionally occurs that the British buyers wait until the tenth day before buying, in order to procure the cattle at the lowest possible price. Of course, many of the tops are bought almost immediately after landing, and in many cases the exporter would be in pocket by accepting market prices for the rest of his cattle, if the market showed any signs of weakening. In any case, he would have the choice of prices ruling during that period.

## TRANSPORTATION OF SHEEP.

In December, 1906, in crossing from Boston to Liverpool I experienced a very rough voyage on ss. *Sachem*, which carried 2,000 head of sheep. These sheep were in boxes and pens on the upper deck. At least 500 head were lost from cold and exposure to rain and spray. One compartment containing 150 sheep was washed overboard. The sheep were of medium class, and were landed at Birkenhead. I am not sufficiently acquainted with sheep conditions to estimate their shrinkage, etc., during this voyage.

Last June I saw on the ss. *Athenia*, leaving Glasgow, several hundred high class pedigreed sheep going to the Toronto exhibition. They had very comfortable quarters on one of the lower decks, and were well fed on roots, hay and chop. Generally speaking, I should say that the export sheep trade requires the same improvements as that of cattle on ship board. I would specially recommend that no sheep be carried on top decks from October 15 to May 15.

## TRANSPORTATION OF HORSES.

For valuable broken horses, the accommodation on trains where shipment is not too large is excellent, as palace horse cars which are very comfortable can be secured. In shipping large train-loads of more or less unbroken horses which, however, is becoming less common, the inferior live stock cars already referred to, must be used. On shipboard the accommodation for horses is better than that for cattle, owing to greater space being allotted on account of their fewer number. Of course, you are aware that at the present time, very few Canadian horses are exported.

## SUGGESTIONS FOR THE IMPROVEMENT OF THE CANADIAN CATTLE TRADE.

1. *Railway Service*.—This as I have before stated is by no means satisfactory. Our freight rates are much too high. The railway companies should be compelled to comply with the law by having printed lists of their rates posted in conspicuous places at shipping points of live stock; and all shippers whether large or small should be given the same attention and advantages.

The present car service should also be a subject of investigation. The superiority of the American cattle cars has been shown in this report.

I would likewise call your attention to the delay in transit, caused by defective system, inferior speed and overloading of cattle trains, as also to the injury to cattle caused by rough and careless handling. No bill of lading should excuse the damage sustained by cattle in transit.



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2. *Preparation of Live Stock for Shipment.*—I would suggest that all possible steps be taken to point out to our Canadian cattle breeders the very great advantage it would be to themselves and also to the cattle, to have all cattle dehorned when calves. This would apply more forcibly to ranch cattle which go in large numbers together and in cold weather squeeze into small space for shelter. This will also help to domesticate them. I might say that it would be advisable in shipping to mix ranch cattle with domestic ones as they will handle better, and load and unload more easily. Cattle should not be shipped direct from the ranch to foreign markets, but should be carefully fed on hay and grain for three months or longer in open sheds, and dehorned (if this has not already been done); during this period also, ranch and domestic cattle should be mixed as much as possible. When well finished the tops should be picked for export, and the remainder shipped to the best Canadian markets.

Very few of our western ranchers have any knowledge of this way of handling cattle, which is general in the United States, and I would suggest that a quantity of printed matter be supplied by the department explaining its advantages.

3. *Montreal Stock Yards.*—Those yards are in themselves sufficiently commodious and comfortable, but are not conveniently situated for the proper handling of export cattle. I would, therefore, suggest the advisability of erecting union stock yards at Montreal. There is a good site for such between the Dominion Coal Company's wharf and the Victoria bridge, and I understand it is the property of the government. Cattle could arrive there from all points by rail, and thence be loaded on ship-board, directly by gangways. Thus, the passage of the cattle through the streets, with its loss of time, as also the loading and unloading from barges, with its consequent abuse and depreciation of the stock, would be eliminated. I consider this a very important matter, as the construction of such yards would make Montreal the foremost cattle port in North America during the season of navigation on the St. Lawrence, since a great number of American shippers would take advantage of these unique facilities, provided that cheap rates prevailed. The export of live cattle to Europe will in all probability increase from year to year.

I might suggest that it would be advantageous to cattle and live stock shippers, if all stock yards were constructed with corrugated concrete floors and with all fixtures and enclosures of small metal. In cases where animals are tied up, iron stanchions should be used. The use of concrete will facilitate cleaning operations, and the use of the smooth metal will reduce chafing to a minimum. I consider this very important, as cattle frequently rub themselves against the wooden fixtures and leave on them a deposit of hair which may contain germs of mange or other diseases. In this connection let me quote President Whaley of the East Buffalo Live Stock Association, who a few weeks ago said apropos of the foot and mouth disease, then prevalent:—‘This is the time that the legislature should get busy framing a law calling for the construction of stock yards of steel and concrete all through the state, with pens so constructed as to be flushed every day. This is the only solution of the problem of sanitary stock yards.’

In conclusion, it is my firm opinion that up-to-date stock yards in Montreal with the above mentioned site and improvements would, if the shippers allowed their cattle sufficient time for rest and feed therein before embarking, greatly diminish the shrinkage on ship-board.

4. *Steamship Service from Canadian Ports.*—The various lines have some ships which are better than others for carriage of cattle, but I should say that none of our Canadian boats are as well equipped as the average American ship. The following suggestions would, I think, if carried out, affect a decided improvement in them:—

1st. The regulation space should be increased to 8 feet 6 inches in length and 2 feet 10 inches in width. An additional space of 18 inches should be left behind



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cattle for removal of manure which will also be facilitated by increasing the number of portholes.

2nd. All floors should be of grooved concrete to facilitate cleaning and prevent slipping; the same should always be sanded according to regulations.

3rd. Three of the cross-pieces should be removed leaving only the hindmost which should be brought forward one foot and be of square shaped metal, embedded in the concrete.

4th. All wooden fixtures should be removed. Troughs should be movable, of galvanized iron, and supplied with water by hose. Tie-ropes should be replaced by movable stanchions or iron tubing.

5th. Hatchways should be sufficiently large to prevent too steep a descent which causes delay and abuse in loading and discharging cattle.

6th. There should be ample ventilation and electric light.

7th. Upper decks should not be used for carriage of cattle during the spring and winter months.

5. *Care of Cattle on Ship-board.*—None but men who are sober and experienced in the care of cattle and accustomed to ocean voyages should be employed, as otherwise the cattle are bound to be seriously neglected. It would be better if these men were regular salaried employees of the shipper, receiving a fair wage, and given comfortable quarters on the ship. Any extra expense in this matter would be more than off-set by the superior condition of the stock when landed. There should be careful supervision of all hay and grain supplied on board, and nothing but best quality accepted.

6. *Care of Cattle at Port of Landing.*—On arrival in port, cattle are unloaded by dockhands. This practice should be abolished. The men who have crossed with the cattle should have full control of their discharging, thus avoiding their being handled by irresponsible, inexperienced, cruel and frequently inebriated wharf-loungers, who do not hesitate to make use of pitch forks, crow-bars, shovels and sticks with prod-nails.

Again, the officials of the Royal Society for the Prevention of Cruelty to Animals are not allowed to go on board ship, although this is where nearly all of the abuse takes place. The Department of Agriculture would do well to make representations to the British Government in order that these officials be allowed to board all ships as soon as docked, and there exercise their authority. In that case, the shipper would receive some real return for the cent per head of cattle, which he is obliged to pay these men. Should there be any officials of the Humane Society of Canada, to supervise the loading and unloading of cattle, I would recommend that they be placed under the jurisdiction of the Canadian Live Stock Commissioner.

#### TRANSFER OF SHIPPING SUPERVISION.

In order that the recommendations I have made in regard to shipping may be carried out I strongly urge that the supervision of the shipping of live stock by sea be transferred from the Department of Marine and Fisheries to the Department of Agriculture. The centralization of markets, involving the transportation by sea of a large proportion of commercial live stock, renders the shipping inseparable from the production and marketing. If it devolves upon the Minister of Agriculture through the Live Stock Commissioner to develop and conserve the live stock industry it at once follows that his supervision should not cease until the marketing of the stock is effected, as to discontinue the chain of supervision is to reduce the efficiency of the work the Government is endeavouring to accomplish and in this way hinder the proper development of the live stock industry of Canada. There is much in the present regulations to com-



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mend but there is need of the improvements recommended and others that would commend themselves to the Live Stock Commissioner who is always in close touch with the actual needs of the industry.

## HINTS FOR SMALL SHIPPERS.

The small shipper is invariably put to serious inconvenience and financial loss, through lack of information and experience, and is entirely in the power of the commission cattle salesmen at the various shipping points, whose prices are so exorbitant as to earn for them the unsavoury nick-name of "The forty thieves." As an instance of this rapacity, I may mention a shipment of my own cattle two years ago in regard to which the charges of these men were so high that the actual cost of transportation and commission to Birkenhead was at least \$10 per bullock in excess of what it would cost me now with my present experience.

In order to protect their interests and lessen the risk of loss in transit, shippers should exercise a personal interest as follows:—

To see that there is no overloading of cattle cars. That the cars be carefully sanded according to law and examined to insure that no nail heads or bolts are left projecting on the inside of cars to tear and injure the animals.

To see that hay and grain are properly distributed in the cars.

To see that all car doors are properly closed.

To see that proper care is exercised in the loading and unloading of cattle and also that the stock is unloaded and properly fed at the necessary feeding points.

To see that the hay, grain and water are properly distributed and of good quality and that all cattle are allowed ample time and sufficient space for feed and rest.

To report delay of railway companies in supplying cars in order that just demurrage may be properly estimated.

To report to the Department of Agriculture if stock yards are not kept in a clean and sanitary condition.

To report unnecessary delay in transit also any injury to cattle caused by rough handling, shunting, etc.

## SPECIAL DUTIES OF LIVE STOCK AGENTS IN MONTREAL, ST. JOHN AND HALIFAX!

To exercise a general supervision of all men crossing with cattle.

To see that regulations are properly carried out as regards ventilation, light specially for each animal, feeding, hatchways, and facilities for securing the cattle on the ships.

To carefully examine all hay and grain supplied for feeding the stock during the ocean voyage.

To superintend loading of all stock into ships and to prevent seriously injured animals being exported.

To see that upper decks are not used for the carriage of stock during the winter and early spring months, also that all necessary hatches be left open for ventilation and the comfort of the stock.

## THROUGH BOOKING OF LIVE STOCK.

Should the Government not see its way to have these agents do the work now done by the commission men, I would suggest that the Railway Companies be prevailed upon to inaugurate a system of through booking, which would still eliminate the commission men, and satisfactorily bridge the gap now existing between producer and consumer. Under this system, the railway companies would take charge of live stock at points in the West, and carry them through to the British markets, at an



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inclusive rate to cover rail and ocean freights, shipping, feeding, attendance, and insurance, under the supervision of the Live Stock Commissioner, who would be represented by officials at the following points, viz:—Calgary, Winnipeg, Toronto, Montreal, Deptford, Liverpool and Glasgow. The sender would thus be better enabled to consign his stock direct to the proper authorities at Deptford, Birkenhead, Glasgow or elsewhere. It would doubtless be necessary for the railroads to issue these through Bills of Lading (with insurance documents attached) to the rancher or dealer out West, who could negotiate them through his bank. The railroads and steamship companies may not perhaps see any advantage to themselves in adopting the scheme. They now get their rail and ocean freights without the detail work involved by the above suggestions. The sender, however, could probably well afford to pay a little more for transport under this scheme by reason of the great advantage to be gained. The shipping, feeding and supplying of attendants by the transport companies should not present insuperable difficulties. I am told the Atlantic Transport Line, from New York to London, have had for some years a system of carrying horses somewhat under the above mentioned conditions, which has worked satisfactorily. Horses are received by them in New York, shipped, attended, fed, and insured through to London at an inclusive rate. The ocean insurance on cattle is already, in many cases, covered by steamship companies; possibly some arrangement could be made by which the railroad companies would also cover the protection of stock in transit, under their through bills of lading.

The above system, if found to be workable, would place the cattle-growers and shippers in direct touch with our salesmen and the Live Stock Commissioner at Winnipeg, Montreal, Deptford, Birkenhead and Glasgow, with much more satisfactory results than now obtained. The proposal may present many difficulties, but before it is condemned as impracticable an influential committee acting in the interests of the Canadian cattlemen would probably not be idly employed in investigating the matter.

This scheme would necessitate better connection between the stock-yards and the boats, which would be accomplished by the erection of a union stock-yard in Montreal, as already suggested.

I have the honour to be,

Sir,

Your obedient servant,

J. J. McHUGH.

The Live Stock Commissioner,  
Ottawa.



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## APPENDIX 16.

## REPORT OF RECORD COMMITTEE.

This, the fourth Annual report of the Record Committee, shows amount of money received for the different Record Associations from January 1, 1908, to December 31, 1908. The total number of registrations and transfers for each breed is given and how distributed by provinces.

The financial statement of the Record Committee shows amount of money received from the different associations and government grant for running expenses and how these monies were disbursed.

An individual statement for each association shows money received for running expenses, how expended, and after adjustment if anything is due from the association or if the association owes the Record Committee.

There is also a comparative statement for the three years 1906, 1907 and 1908, showing number of registrations and transfers made for each association and the amount of money received and deposited.

It may be well to state for the information of those who may not be familiar with the working of the Record Office that all monies received are deposited daily in the Imperial bank to the credit of the association for which they are sent. The running expenses are provided for by a monthly remittance from the different associations and from government grant for non-paying associations. These remittances and grant are deposited to the credit of the Record Committee, and salaries are paid by cheque of treasurer of Record Committee, countersigned by the chairman.

From the time of organization of records of thoroughbred and French-Canadian horses; sheep; Aberdeen-Angus, Galloway, Jersey, French-Canadian and Guernsey cattle to December 31, 1907, the cost of conducting these records had been borne by the Record Committee, the money being taken from a grant given by the Department of Agriculture for the purpose of assisting weak associations in process of organization.

From January 1, 1908, these records were placed on the list of self-sustaining records, the only assistance being given them is as shown in the different financial statements and is the same proportionately as is given all self-sustaining associations in the National Record system. The grants to associations combined are equal to one half the salary of the accountant; in other words, the Record Associations pay half the salary of the Accountant, the other half is paid out of the government grant. The total cost of conducting the Red Polled, Pony, Belgian and Percheron records during 1908 has been paid by the Record Committee out of the grant.

## FINANCIAL STATEMENT FOR THE YEAR ENDING DECEMBER 31, 1908.

*Receipts.*

Balance on hand December 31, 1907.. . . .	\$ 617 22
Dominion government grant.. . . .	4,105 00
Dominion Shorthorn Breeders' Association—	
Levy for salaries, 1908.. . . .	\$3,249 96
“    refunds, 1908.. . . .	480 00
	<hr/>
	\$3,729 96
Canadian Ayrshire Breeders' Association—	
Adjustment of charges, 1907.. . . .	\$ 108 51
Levy for salaries, 1908.. . . .	590 00
“    refunds, 1908.. . . .	88 50
	<hr/>
	787 01



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Clydesdale Horse Association of Canada—		
Adjustment of charges, 1907..	\$ 462 86	
Levy for salaries, 1908..	1,320 00	
“ refunds, 1908..	375 00	2,157 86
Canadian Hereford Breeders' Association—		
Levy for salaries, 1908..	\$ 249 96	
“ refunds, 1908..	40 00	289 96
Dominion Swine Breeders' Association—		
Adjustment of charges, 1907..	\$ 166 01	
Levy for salaries, 1908..	1,200 00	
“ refunds, 1908..	100 00	1,466 01
Canadian Hackney Horse Society—		
Adjustment of charges, 1907..	\$45 29	45 29
Canadian Shire Horse Association—		
Adjustment of charges, 1907..	\$25 76	25 76
Canadian Aberdeen Angus Association—		
Levy for refunds, 1908..	\$63 30	63 30
Received for import certificates..		37 00
		\$13,324 37

(Sgd.) JOHN W. BRANT,  
Treasurer.

(Sgd.) GEO. L. BLATCH, F.C.A.,  
Auditor.

Expenditures.

Salaries in Record Office—		
John W. Brant..	\$1,767 66	
J. W. Nimmo..	1,500 00	
H. E. Martinette..	1,500 00	
F. M. Wade..	1,200 00	
R. G. T. Hitchman..	1,200 00	
E. J. Bartlett..	633 33	
A. M. Day..	477 33	
I. Larose..	487 50	
I. B. Moodie..	310 50	
F. M. Blow..	108 00	
N. Moodie..	184 00	
W. D. McLennan..	45 00	
E. E. Perry..	90 00	\$9,503 32
Expenses of Record Committee..		528 50
Dominion Shorthorn Breeders' Association—		
Adjustment of charges, 1907..	\$419 18	
Canadian Hereford Breeders' Association—		
Adjustment of charges, 1907..	40 21	459 39
Auditing six months, 1907..	\$ 75 00	
“ Record Committee, 1907..	20 00	
“ 1908..	115 00	210 00
Printing..		95 00
Refund of excessive fees..		1,195 72
Petty expenses..		26 54
Balance on hand December 31, 1908..		1,275 90
		\$13,324 37

(Sgd.) JOHN W. BRANT,  
Treasurer.

(Sgd.) GEO. L. BLATCH, F.C.A.,  
Auditor.

DOMINION SWINE BREEDERS' ASSOCIATION.

REGISTRATIONS, TRANSFERS, &C., 1908.

Registrations..	4,435
Transfers..	459
Dup. and New Certificates..	35
Memberships Rec..	375



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DISTRIBUTION BY PROVINCES.

	Registra- tions.	Transfers.	Dup. and New Certificates.	Member- ships Rec.
Ontario.. . . .	2,131	191	12	112
Manitoba.. . . .	555	77	8	65
Saskatchewan.. . . .	299	49	4	15
Alberta.. . . .	238	35	5	22
British Columbia.. . . .	99	5	....	7
Quebec.. . . .	859	81	5	63
New Brunswick.. . . .	79	3	....	9
Nova Scotia.. . . .	86	3	....	4
Prince Edward Island.. . . .	77	15	....	9
United States.. . . .	12	....	1	1

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Dominion Swine Breeders' Associaton.  
January 1 to December 31, 1908.

For registrations and memberships.. . . . \$3,422 00

RECEIPTS AND EXPENDITURES FOR CONDUCTING SWINE RECORD.

Receipts.

Received from association to pay salaries, 1908.. . . .	\$1,200 00
Received from association to pay refunds, 1908.. . . .	100 00
Applied from government grant, 1908.. . . .	157 36
Balance owing to Record Committee by association.. . . .	114 83
	<u>\$1,572 19</u>

Expenditures.

Paid salaries to December 31, 1908.. . . .	\$1,430 23
" refunds to December 31, 1908.. . . .	116 16
" for audit to December 31, 1908.. . . .	25 80
	<u>\$1,572 19</u>
(Sgd.) JOHN W. BRANT, Treasurer.	(Sgd.) GEO. L. BLATCH, F.C.A., Auditor.

DOMINION SHEEP BREEDERS' ASSOCIATION.

REGISTRATIONS, TRANSFERS, &C., 1908.

Registrations.. . . .	2,060
Transfers.. . . .	190
Dup. and New Certificates.. . . .	13
Memberships Rec.. . . .	196

DISTRIBUTION BY PROVINCES.

	Registra- tions.	Transfers.	Dup. and New Certificates.	Member- ships Rec.
Ontario.. . . .	1,021	77	5	62
Manitoba.. . . .	34	2	....	4
Saskatchewan.. . . .	19	....	....	2
Alberta.. . . .	92	4	....	
British Columbia.. . . .	60	9	....	13
Quebec.. . . .	784	97	8	105
New Brunswick.. . . .	24	....	....	7
Nova Scotia.. . . .	23	....	....	2
Prince Edward Island.. . . .	3	1	....	1



1 GEORGE V., A. 1911

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Dominion Sheep Breeders' Association.

January 1 to December 31, 1908.

For registrations and memberships.. . . . .	\$1,314 84
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## RECEIPTS AND EXPENDITURES FOR CONDUCTING SHEEP RECORD.

### Receipts.

Applied from government grant, 1908.. .. .	\$108 66	
Balance owing to Record Committee by association.. .. .	503 68	
	<hr/>	\$612 34

### Expenditures.

Paid salaries to December 31, 1908.. . . . .	\$525 78	
“ refunds to December 31, 1908.. . . . .	74 72	
“ for audit to December 31, 1908.. . . . .	11 84	
	<hr/>	\$612 34
(Sgd.) JOHN W. BRANT, Treasurer,	(Sgd.) GEO. L. BLATCH, F.C.A., Auditor.	

DOMINION SHORTHORN BREEDERS' ASSOCIATION.

## REGISTRATIONS, TRANSFERS, &amp;C., 1908.

Registrations.. .. .	7,038
Transfers.. .. .	2,272
Dup. and New Certificates.. .. .	480
Memberships Rec.. .. .	1,512

### DISTRIBUTION BY PROVINCES.

	Registra- tions.	Transfers.	Dup. and New Certificates.	Member- ships Rec.
Ontario.. . . . .	4,315	1,251	284	977
Manitoba.. . . . .	1,098	439	81	247
Saskatchewan.. . . . .	387	158	44	93
Alberta.. . . . .	635	238	55	103
British Columbia.. . . . .	45	20	....	14
Quebec.. . . . .	268	113	13	43
New Brunswick.. . . . .	42	15	....	4
Nova Scotia.. . . . .	107	24	2	16
Prince Edward Island.. . . . .	35	8	....	9
United States.. . . . .	106	6	1	6

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Dominion Shorthorn Breeders' Association.

January 1 to December 31, 1908.

For registration and membership.. . . . .	\$10,806	10
“ herd books.. . . . .	26	00
From W. G. Pettit, balance on hand.. . . . .	100	80
	<u>          </u>	\$10,932 90

## RECEIPTS AND EXPENDITURES FOR CONDUCTING SHORTHORN RECORD.

### Receipts.

Received from association to pay salaries, 1908.. .. .	\$3,249 96	
refunds, 1908.. .. .	480 00	
Applied from government grant, 1908.. .. .	311 82	
	<u>          </u>	4,041 78



### Expenditures.

Paid salaries to December 31, 1908.. . . . .	\$2,813 62
" refunds to December 31, 1908.. . . . .	378 03
" for audit, 1908.. . . . .	51 25
Balance owing to association by Record Committee.. . . .	798 88
	<hr/>
	4,041 78

(Sgd.) GEO. L. BLATCH, F.C.A.,  
Auditor.

CANADIAN AYRSHIRE BREEDERS' ASSOCIATION.

## REGISTRATIONS, TRANSFERS, &amp;c., 1908.

Registrations.. .. .	1,653
Transfers.. .. .	694
Dup. and New Certificates.. .. .	64
Memberships Rec.. .. .	242

### DISTRIBUTION BY PROVINCES.

	Registra- tions.	Transfers.	Dup. and New Certificates.	Member- ships Rec.
Ontario.. . . . .	412	161	16	75
Manitoba.. . . . .	39	21	3	8
Saskatchewan.. . . . .	11	8	....	2
Alberta.. . . . .	12	6	....	3
British Columbia.. . . . .	35	18	3	6
Quebec.. . . . .	1,003	445	39	122
New Brunswick.. . . . .	63	13	2	7
Nova Scotia.. . . . .	33	13	....	8
Prince Edward Island.. . . . .	27	6	1	5
United States.. . . . .	18	3	....	5

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Canadian Ayrshire Breeders' Association.  
January 1 to December 31, 1908.

For registration and memberships.. . . . .	\$2,687 93	
" herd books.. . . . .	8 00	
	<hr/>	\$2,695 93

## RECEIPTS AND EXPENDITURES FOR CONDUCTING AYRESHIRE RECORD.

### Receipts.

Received from association to pay salaries, 1908.. .. .	\$590 00
refunds, 1908.. .. .	88 50
Applied from government grant, 1908.. .. .	76 91
Balance owing to Record Committee by association.. .. .	36 25
	<hr/>
	\$791 66

### Expenditures.

Paid salaries to December 31, 1908.. .. .	\$698 57	
“ refunds to December 31, 1908.. .. .	80 48	
“ for audit to December 31, 1908.. .. .	12 61	
	<hr/>	\$791 66

(Sgd.) GEO. L. BLATCH, F.C.A.,  
Auditor.







SESSIONAL PAPER No. 15b

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Canadian Jersey Cattle Club. January 1 to December 31, 1908.

For registrations and memberships.. . . . \$304 80

RECEIPTS AND EXPENDITURES FOR CONDUCTING JERSEY RECORD.

Receipts.

Applied from government grant, 1908.. . . . \$ 10 18  
Balance owing Record Committee by association.. . . . 109 55  
\$119 73

Expenditures.

Paid salaries to December 31, 1908.. . . . \$ 92 07  
" refunds to December 31, 1908.. . . . 25 99  
" audit to December 31, 1908.. . . . 1 67  
\$119 73

(Sgd.) JOHN W. BRANT, Treasurer. (Sgd.) GEO. L. BLATCH, F.C.A., Auditor.

NORTH AMERICAN GALLOWAY ASSOCIATION.

REGISTRATIONS, TRANSFERS, &C., 1908.

Registrations.. . . . 96  
Transfers.. . . . 15  
Dup. and New Certificates.. . . .  
Memberships Rec.. . . . 7

DISTRIBUTION BY PROVINCES.

	Registra- tions.	Transfers.	Dup. and New Certificates.	Member- ships Rec.
Ontario.. . . .	7	....	....	1
Manitoba.. . . .	50	14	....	2
Saskatchewan.. . . .	7	....	....	1
Alberta.. . . .	32	1	....	3

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the North American Galloway Association. January 1 to December 31, 1908.

For registrations and memberships.. . . . \$119 15

RECEIPTS AND EXPENDITURES FOR CONDUCTING THE GALLOWAY RECORD.

Receipts.

Applied from government grant, 1908.. . . . \$ 3 54  
Balance owing to Record Committee by association.. . . . 34 30  
\$37 84  
Paid salaries to December 31, 1908.. . . . \$32 20  
" refunds to December 31, 1908.. . . . 5 06  
For audit to December 31, 1908.. . . . 58  
\$37 84

(Sgd.) JOHN W. BRANT, Treasurer. (Sgd.) GEO. L. BLATCH, F.C.A., Auditor.



1 GEORGE V., A. 1911

CANADIAN GUERNSEY BREEDERS' ASSOCIATION.

REGISTRATIONS, TRANSFERS, &C., 1908.

Registrations.. . . . .	73
Transfers.. . . . .	5
Dup. and New Certificates.. . . . .	3
Memberships Rec.. . . . .	11

DISTRIBUTION BY PROVINCES.

	Registra- tions.	Transfers.	Dup. and New Certificates.	Member- ships Rec.
Ontario.. . . . .	5	3	....	2
Quebec.. . . . .	7	....	....	4
New Brunswick.. . . . .	7	1	....	1
Nova Scotia.. . . . .	40	1	3	4
Prince Edward Island.. . . . .	14	....	....	

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Canadian Guernsey Breeders' Association.  
January 1 to December 31, 1908.

For registrations and memberships.. . . . . \$68 25

RECEIPTS AND EXPENDITURES FOR THE CONDUCTING OF THE GUERNSEY RECORD.

Receipts.

Applied from government grant, 1908.. . . . .	\$ 2 58	
Balance owing to Record Committee by association.. . . . .	24 38	
		\$26 96

Expenditures.

Paid salaries to December 31, 1908.. . . . .	\$23 48	
" refunds to December 31, 1908.. . . . .	3 06	
" audit to December 31, 1908.. . . . .	42	
		\$26 96
(Sgd.) JOHN W. BRANT, Treasurer.	(Sgd.) GEO. L. BLATCH, F.C.A., Auditor.	

CANADIAN ABERDEEN ANGUS ASSOCIATION.

REGISTRATIONS, TRANSFERS, &C., 1908.

Registrations.. . . . .	820
Transfers.. . . . .	94
Dup. and New Certificates.. . . . .	22
Memberships Rec.. . . . .	67

DISTRIBUTION BY PROVINCES.

	Registra- tions.	Transfers.	Dup. and New Certificates.	Member- ships Rec.
Ontario.. . . . .	167	52	21	21
Manitoba.. . . . .	410	14	1	26
Saskatchewan.. . . . .	76	4	....	6
Alberta.. . . . .	150	24	....	11
Quebec.. . . . .	4	....	....	2
Prince Edward Island.. . . . .	12	....	....	1
United States.. . . . .	1	....	....	



SESSIONAL PAPER No. 15b

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Canadian Aberdeen Angus Association.  
January 1 to December 31, 1908.

For registrations and memberships.. . . . .	\$561 35	
" herd books.. . . . .	2 00	
		\$563 35

RECEIPTS AND EXPENDITURES FOR CONDUCTING ABERDFEN ANGUS RECORD.

Receipts.

Applied from government grant, 1908.. . . . .	\$ 25 39	
" from association to pay refunds.. . . . .	63 30	
Balance owing Record Committee by association.. . . . .	213 83	
		\$302 52

Expenditures.

Paid salaries to December 31, 1908.. . . . .	\$229 95	
" refunds to December 31, 1908.. . . . .	68 41	
" for audit to December 31, 1908.. . . . .	4 16	
		\$302 52

(Sgd.) JOHN W. BRANT, Treasurer. (Sgd.) GEO. L. BLATCH, F.C.A., Auditor.

FRENCH CANADIAN CATTLE BREEDERS' ASSOCIATION.

REGISTRATIONS, TRANSFERS, &C., 1908.

Registrations.. . . . .	324
Transfers.. . . . .	51
Dup. and New Certificates.. . . . .	8
Memberships Rec.. . . . .	38

DISTRIBUTION BY PROVINCES.

	Registra- tions.	Transfers.	Dup. and New Certificates.	Member- ships Rec.
Ontario.. . . . .	3	2	1	1
Manitoba.. . . . .	4	...	...	1
Quebec.. . . . .	317	49	7	35

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the French Canadian Cattle Breeders' Association.  
January 1 to December 31, 1908.

For registrations and memberships.. . . . .	\$174 75
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RECEIPTS AND EXPENDITURES FOR CONDUCTING FRENCH CANADIAN CATTLE RECORD.

Receipts.

Applied from government grant, 1908.. . . . .	\$ 48 82	
Balance owing to Record Committee by association.. . . . .	98 85	
		\$147 67
Paid salaries to December 31, 1908.. . . . .	\$128 90	
" refunds to December 31, 1908.. . . . .	16 77	
" for audit to December 31, 1908.. . . . .	2 00	
		\$147 67

(Sgd.) JOHN W. BRANT, Treasurer. (Sgd.) GEO. L. BLATCH, F.C.A., Auditor.



1 GEORGE V., A. 1911

CANADIAN RED POLLED ASSOCIATION.

REGISTRATIONS, TRANSFERS, &C., 1908.

Registrations.. . . .	172
Transfers.. . . .	5
Dup. and New Certificates.. . . .	1
Memberships Rec.. . . .	2

DISTRIBUTION BY PROVINCES.

	Registra- tions.	Transfers.	Dup. and New Certificates.	Member- ships Rec.
Manitoba.. . . .	131	3	....	1
Saskatchewan.. . . .	35	....	1	1
Alberta.. . . .	6	2	....	

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Canadian Red Polled Association.  
January 1 to December 31, 1908.

For registrations and memberships.. . . .	\$40 50
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RECEIPTS AND EXPENDITURES FOR CONDUCTING RED POLLED RECORD.

Receipts.

Applied from government grant, 1908.. . . .	\$49 62
Balance owing to Record Committee by association.. . . .	1 06
	\$50 68

Expenditures.

Paid salaries to December 31, 1908.. . . .	\$48 74
" refunds to December 31, 1908.. . . .	1 06
" audit to December 31, 1908.. . . .	88
	\$50 68

(Sgd.) JOHN W. BRANT, Treasurer. (Sgd.) GEO. L. BLATCH, F.C.A., Auditor.

CLYDESDALE HORSE ASSOCIATION OF CANADA.

REGISTRATIONS, TRANSFERS, &C., 1908.

Registrations.. . . .	2,665
Transfers.. . . .	560
Dup. and New Certificates.. . . .	53
Memberships Rec.. . . .	586

DISTRIBUTION BY PROVINCES.

	Registra- tions.	Transfers.	Dup. and New Certificates.	Member- ships Rec.
Ontario.. . . .	1,454	251	35	373
Manitoba.. . . .	321	127	11	86
Saskatchewan.. . . .	340	71	2	52
Alberta.. . . .	314	66	1	35
British Columbia.. . . .	62	17	....	12
Quebec.. . . .	133	23	2	20
New Brunswick.. . . .	12	....	1	
Nova Scotia.. . . .	15	1	1	3
Prince Edward Island.. . . .	5	3	....	2
United States.. . . .	9	1	....	3



Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Clydesdale Horse Association of Canada.  
January 1 to December 31, 1908.

### Receipts.

### Expenditures.

(Sgd.) JOHN W. BRANT, (Sgd.) GEO. L. BLATCH, F.C.A.,  
Treasurer. Auditor.

## REGISTRATIONS, TRANSFERS, &amp;C., 1908.

### DISTRIBUTION BY PROVINCES

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Shire Horse Association. January 1 to December 31, 1908.

RECEIPTS AND EXPENDITURES FOR CONDUCTING THE SHIRE RECORD.

### Receipts.

*Expenditures.*

(Sgd.) JOHN W. BRANT, Treasurer. (Sgd.) GEO. L. BLATCH, F.C.A., Auditor.



1 GEORGE V., A. 1911

CANADIAN HACKNEY HORSE SOCIETY.

REGISTRATIONS, TRANSFERS, &C., 1908.

Registrations.. . . .	112
Transfers.. . . .	15
Dup. and New Certificates.. . . .	3
Memberships Rec.. . . .	21

DISTRIBUTION BY PROVINCES.

	Registrations.	Transfers.	Dup. and New Certificates.	Memberships Rec.
Ontario.. . . .	53	3	1	8
Manitoba.. . . .	8	3	....	1
Saskatchewan.. . . .	5	2	....	3
Alberta.. . . .	5	3	....	
British Columbia.. . . .	8	2	....	4
Quebec.. . . .	15	....	....	2
Nova Scotia.. . . .	2	2	1	
United States.. . . .	16	....	1	3

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Canadian Hackney Horse Society.  
January 1 to December 31, 1908.

For registrations and memberships.. . . .	\$340 85	
" stud book.. . . .	2 00	
		\$342 85

RECEIPTS AND EXPENDITURES FOR CONDUCTING HACKNEY RECORD.

Receipts.

Applied from government grant, 1908.. . . .	\$ 4 14	
Balance owing to Record Committee by Society.. . . .	47 39	
		\$51 53

Expenditures.

Paid salaries to December 31, 1908.. . . .	\$13 74	
" refunds to December 31, 1908.. . . .	7 11	
" for audit to December 31, 1908.. . . .	68	
		\$51 53

(Sgd.) JOHN W. BRANT, Treasurer. (Sgd.) GEO. L. BLATCH, F.C.A., Auditor.

FRENCH CANADIAN HORSE BREEDERS' ASSOCIATION.

REGISTRATIONS, TRANSFERS, &C., 1908.

Registrations.. . . .	246
Transfers.. . . .	8
Dup. and New Certificates.. . . .	....
Memberships Rec.. . . .	17

DISTRIBUTION BY PROVINCES.

	Registrations.	Transfers.	Dup. and New Certificates.	Memberships Rec.
Quebec.. . . .	242	8	....	16
United States.. . . .	4	....	....	1



SESSIONAL PAPER No. 15b

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the French Canadian Horse Breeders' Association. January 1 to December 31, 1908.

For registration and memberships.. . . . \$237 60

RECEIPTS AND EXPENDITURES FOR CONDUCTING THE FRENCH CANADIAN HORSE RECORD.

Receipts.

Applied from government grant, 1908.. . . . \$ 8 01  
Balance owing to Record Committee by association.. . . . 85 94  
\$93 95

Expenditures.

Paid salaries to December 31, 1908.. . . . \$84 47  
" refunds to December 31, 1908.. . . . 8 17  
" for audit to December 31, 1908.. . . . 1 31  
\$93 95

(Sgd.) JOHN W. BRANT, Treasurer. (Sgd.) GEO. L. BLATCH, F.C.A., Auditor.

CANADIAN PERCHERON HORSE BREEDERS' ASSOCIATION.

REGISTRATIONS, TRANSFERS, &c., 1908.

Registrations.. . . . 1,244  
Transfers.. . . . 6  
Dup. and New Certificates.. . . .  
Memberships Rec.. . . . 37

DISTRIBUTION BY PROVINCES.

	Registra- tions.	Transfers.	Dup. and New Certificates.	Member- ships Rec.
Ontario.. . . .	195	....	....	11
Manitoba.. . . .	157	....	....	6
Saskatchewan.. . . .	256	3	....	5
Alberta.. . . .	483	2	....	6
British Columbia.. . . .	26	....	....	2
Quebec.. . . .	29	1	....	5
New Brunswick.. . . .	3	....	....	1
United States.. . . .	95	....	....	1

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Canadian Percheron Horse Breeders' Association. January 1 to December 31, 1908.

For registrations and memberships.. . . . \$1,176 85

RECEIPTS AND EXPENDITURES FOR CONDUCTING THE PERCHERON RECORD.

Receipts.

Applied from government grant, 1908.. . . . \$455 57  
Balance owing to Record Committee by association.. . . . 22 12  
\$477 69

Expenditures.

Paid salaries to December 31, 1908.. . . . 449 07  
" refunds to December 31, 1908.. . . . 22 12  
" audit to December 31, 1908.. . . . 6 50  
\$477 69

(Sgd.) JOHN W. BRANT, Treasurer. (Sgd.) GEO. L. BLATCH, F.C.A., Auditor.



1 GEORGE V., A. 1911

CANADIAN BELGIAN DRAFTHORSE BREEDERS' ASSOCIATION.

REGISTRATIONS, TRANSFERS, &C., 1908.

Registrations.. . . .	16
Transfers.. . . .	....
Dup. and New Certificates.. . . .	....
Memberships Rec.. . . . .	3

DISTRIBUTION BY PROVINCES.

	Registra- tions.	Transfers.	Dup. and New Certificates.	Member- ships Rec.
Alberta.. . . .	1	....	....	1
Quebec.. . . .	14	....	....	1
United States.. . . .	1	....	....	1

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Canadian Belgian Draft Horse Breeders' Association.  
January 1 to December 31, 1908.

For registrations and memberships.. . . .	\$80 00
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RECEIPTS AND EXPENDITURES FOR CONDUCTING THE BELGIAN DRAFT RECORD.

Receipts.

Applied from government grant, 1908.. . . .	\$5 46	
Balance owing to Record Committee by association.. . . .	3 02	
		\$8 48

Expenditures.

Paid salaries to December 31, 1908.. . . .	\$5 38	
" refunds to December 31, 1908.. . . .	3 02	
" for Audit to December 31, 1908.. . . .	8	
		\$8 48

(Sgd.) JOHN W. BRANT, Treasurer. (Sgd.) GEO. L. BLATCH, F.C.A., Auditor

CANADIAN THOROUGHBRED HORSE SOCIETY.

REGISTRATIONS, TRANSFERS, &C., 1908.

Registrations.. . . .	139
Transfers.. . . .	....
Dup. and New Certificates.. . . .	1
Memberships Rec.. . . . .	24

DISTRIBUTION BY PROVINCES.

	Registra- tions.	Transfers.	Dup. and New Certificates.	Member- ships Rec.
Ontario.. . . .	79	....	....	21
Manitoba.. . . .	27	....	....	1
Saskatchewan.. . . .	2	....	....	2
Alberta.. . . .	4	....	....	
British Columbia.. . . .	3	....	....	
Quebec.. . . .	24	....	1	



SESSIONAL PAPER No. 15b

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Canadian Thoroughbred Horse Society.  
January 1 to December 31, 1908.

For registrations and memberships.. . . . \$262 40

RECEIPTS AND EXPENDITURES FOR CONDUCTING THOROUGHBRED RECORD.

Receipts.

Applied from government grant, 1908.. . . . \$ 4 47  
Balance owing to Record Committee by society.. . . . 45 83  
\$50 30

Expenditures.

Paid salaries to December 31, 1908.. . . . \$47 13  
" refunds to December 31, 1908.. . . . 2 44  
" for audit to December 31, 1908.. . . . 73  
\$50 30

(Sgd.) JOHN W. BRANT, Treasurer. (Sgd.) GEO. L. BLATCH, F.C.A., Auditor.

CANADIAN PONY SOCIETY.

REGISTRATIONS, TRANSFERS, &C., 1908.

Registrations.. . . . 49  
Transfers.. . . .  
Dup. and New Certificates.. . . .  
Memberships Rec.. . . . 5

DISTRIBUTION BY PROVINCES.

	Registra- tions.	Transfers.	Dup. and New Certificates.	Member- ships Rec.
Ontario.. . . .	10	....	....	1
Manitoba.. . . .	1	....	....	
Alberta.. . . .	36	....	....	1
United States.. . . .	2	....	....	1

Cash received at the National Record Office and deposited in the Imperial Bank to the credit of the Canadian Pony Society. January 1 to December 31, 1908.

For registrations and memberships.. . . . \$64 20

RECEIPTS AND EXPENDITURES FOR CONDUCTING THE PONY RECORD.

Receipts.

Applied from government grant, 1908.. . . . \$11 54  
Balance owing to Record Committee by society.. . . . 5 36  
\$16 90

Expenditures.

Paid salaries to December 31, 1908.. . . . \$11 29  
" refunds to December 31, 1908.. . . . 5 36  
" for audit to December 31, 1908.. . . . 25  
\$16 90

(Sgd.) JOHN W. BRANT, Treasurer. (Sgd.) GEO. L. BLATCH, F.C.A., Auditor.



1 GEORGE V., A. 1911

COMPARATIVE STATEMENT FOR THE YEARS 1906, 1907, AND 1908, SHOWING PEDIGREE AND TRANSFERS RECORDED AND AMOUNT OF FEES RECEIVED.

Name of Asso'n.	Pedigrees Recorded.			Transfers Recorded.			Money Received.		
	1906	1907	1908	1906	1907	1908	1906	1907	1908
Shorthorn .....	9653	10253	7038	2626	2804	2272	11859·95	14508·40	10832·10
Ayrshire .....	2075	2144	1653	651	914	694	2225·92	2797·90	2695·93
Hereford. ....	1066	683	901	345	141	277	836·65	828·45	933·35
Swine.....	6637	6277	4435	533	594	459	4447·15	4562·93	3422·00
Clydesdale ..	2418	6117	2665	520	511	560	3281·20	7296·40	4575·19
Hackney. ....	103	132	112	22	55	15	262·90	395·40	342·85
Shire.....	53	100	124	12	8	9	102·50	165·00	194·50
Thoroughbred..	52	6	139	.....	.....	.....	59·00	24·00	262·40
Sheep....	1281	3628	2060	100	240	190	450·25	1234·95	1314·84
Aberdeen Angus	1274	1106	820	40	84	94	268·75	341·60	563·35
Galloway ..	81	103	96	7	4	15	68·25	56·25	119·15
Jerseys.....	134	326	223	6	27	92	135·25	334·85	304·80
Red Polled.....	353	36	172	.....	2	5	17·75	28·00	40·50
Guernsey .....	33	38	73	5	4	5	25·25	47·50	68·25
Canadian Cattle	667	576	324	22	42	51	134·55	135·50	174·75
Canadian Horses	84	474	246	13	3	8	101·00	228·50	237·60
Total .....	25964	31999	21081	4902	5433	4746	24276·27	32985·63	26081·56



SESSIONAL PAPER No. 15b

DISTRIBUTION OF SALARIES, 1908.

	Shroton Assn.	Ayrshire Assn.	Hereford Assn.	Clydesdale Assn.	Hackney Society.	Shire Assn.	Thoroughbred Society.	Swine Assn.	Sheep Assn.	Albion Assn.	Galloway Assn.	Jersey Club.	Guernsey Assn.	French Can. Horse Assn.	French Can. Cattle Assn.	Government Grant.	Total Salary.
John W. Brant.	311 82	76 91	38 63	105 00	4 14	3 96	4 47	157 36	72 19	25 39	3 54	10 18	2 38	8 01	12 22	931 26	1767 66
J. W. Nimmo		360 65	180 65					738 95		118 40	16 65	47 35	12 15			25 20	1500 00
H. E. Martinette														61 24	56 85	1381 91	1500 00
F. M. Wade				800 33	31 72	30 25	34 16									203 54	1200 00
R. G. T. Hitchman	1200 00																1200 00
E. J. Bartlett.	224 00	55 21	27 70	75 00	2 98	2 84	3 21	112 90	51 32	18 23	2 54	7 31	1 85	5 74	8 77	33 73	633 83
A. M. Day.		114 76	57 64					234 75		37 88	5 28	15 18	3 85			7 99	477 33
I. Larose	58 23	14 13	7 10	19 87	76	73	82	28 91	293 61	4 66	65	1 87	47	1 47	2 24	51 98	487 50
I. B. Moodie	280 75															29 75	310 50
N. Moodie	184 00																184 00
F. M. Blow.	108 00																108 00
F. E. Perry.	90 00																90 00
W. D. McLellan.	45 00																45 00
Total charged to Association.	2501 80	621 66	311 72	1000 20	39 40	37 78	42 66	1272 87	417 12	204 56	28 06	81 89	20 90	76 40	80 08	2765 36	9503 32

NOTE. \$1341 41 of H. E. Martinette's salary was paid to him as translator. All salaries in connection with Red Poll, Percheron, Belgian and Pony records were paid out of Government Grant.



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Volumes of Record composed of pedigrees recorded up to December 31, 1908, have been issued as follows: Shorthorn Volume 25, Swine Breeders' Record Volume 19, Ayrshire Herd Book Volume 17, Hereford Herd Book Volume 5, Clydesdale Stud Book Volume 16, French-Canadian Cattle Herd Book Volume 1.

The Canadian Percheron Record and the Canadian Belgian Draft Record are now fully established, the difficulty of obtaining the Old Country Stud Books experienced when the Records were first formed and which was referred to in the last Annual Report has been overcome through the courtesy of Mr. Geo. W. Stubblefield, Chicago, Secretary of the American Percheron Registry Association, who procured the French Percheron Books, and Mr. H. Ketels, the Belgian-Consul General at Ottawa, who obtained the Belgian Stud Books. These gentlemen went to a great deal of personal trouble in the matter and the Record Committee wish to place their appreciation on record.

During the year new Records have been opened for Shetland, Welsh, Hackney, New Forest, Exmoor and Polo and Riding Ponies and for Suffolk, Cheviot and Highland Blackface Sheep.

In accordance with the resolution passed at the last Annual Meeting of the Record Board regarding the free admission of animals for breeding purposes, the Minister of Agriculture kindly made representations to the Minister of Customs resulting in the passing of an Order-in-Council by which animals imported free of duty must be recorded in the Canadian Record for the breed, providing a Canadian Record exists and Canadian Certificates presented to the Collector of Customs at the Port of entry. In the case of breeds for which there are no Canadian Records, animals are admitted on presentation of Import Certificates issued by the National Record Office, providing such animals are recorded in the Record of the Country of the origin of the breed, and such foreign record is recognized as reliable by the Record Committee. The regulations having been in force since July 1st, 1908, and not being readily understood by all, arrangements have been made to have them simplified and in future the importer must in all cases present to the Collector of Customs an Import Certificate.

The regulations are already having a beneficial effect, undesirable animals being refused free Custom entry as well as animals which are not eligible for Canadian registration. The Committee wishes to point out to intending importers that it is advisable before purchasing animals in a foreign country, to ascertain if they are eligible for entry in the Canadian Records. This is especially advisable in the case of Percheron horses; in addition to the Stud Book of the Société Hippique Percheronne de France the only other Record recognized is the Record of the Percheron Society of America, Geo. W. Stubblefield, Secretary. Information regarding eligibility can always be procured by sending a description of the breeding of an animal to the National Record Office, Ottawa. It would also be well if users of stallions demanded production of Canadian Certificates of Registration, thereby avoiding trouble in the recording of progeny.

To secure the reduced transportation rates over the principal Canadian railways for animals for breeding purposes, recorded in the Canadian Records, it is now necessary to present to the Railway agent a Canadian Certificate of Registration bearing the Seal of the Department of Agriculture. This arrangement is in accordance with the repeated requests of the railway authorities for a uniform certificate of registration. In the case of imported animals of a breed for which there is no Canadian Record but which are recorded in a recognized Foreign Record, an arrangement has been made for transportation at reduced rates from the point of entry into Canada to destination on presentation of a transportation certificate to the railway agent. This certificate is issued by the National Record Office in connection with Import Certificate and is taken up by the railway agent.

Cases of alleged false registration of pedigrees have been investigated and it has



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been found necessary to cancel a number of entries. As occasion arises, investigation will be made, and if circumstances warrant prosecutions will follow.

In conclusion the Committee, for valuable assistance rendered, desires to thank the Minister of Agriculture, the Minister of Customs, the Live Stock Commissioner, the Commissioner of Customs and other officials of the Departments of Agriculture and Customs.

All of which is respectfully submitted,—

ROBERT MILLER, Chairman.

WM. SMITH, representing Heavy Horses.

ROBERT GRAHAM, Light Horses.

JOHN DRYDEN, Beef Cattle.

ROBERT NESS, Dairy Cattle.

J. E. BRETHOUR, Swine.

J. M. GARDHOUSE, Sheep.

JNO. W. BRANT, Secretary.

## MEMBERS OF RECORD BOARD, 1908.

*Representing Caledale Associations:*—Robert Graham, Bedford Park, Ont.; William Smith, Columbus, Ont.; John Bright, Myrtle Station, Ont.; Robert Ness, Howick, Que.

*Hackney:*—Walter Renfrew, Bedford Park, Ont.; T. A. Graham, Claremont, Ont.

*Shorthorn:*—John Dryden, Toronto, Ont.; J. G. Barron, Carberry, Man.; Robert Miller, Stouffville, Ont.; A. W. Smith, Maple Lodge, Ont.; J. M. Gardhouse, Weston, Ont.; T. E. Robson, London, Ont.; W. G. Pettit, Freeman, Ont.

*Ayrshire:*—Robert Ness, Howick, Que.; W. W. Ballantyne, Stratford, Ont.

*Hereford:*—R. J. Mackie, Oshawa, Ont.; W. H. Hunter, The Maples, Ont.

*Shire:*—John Gardhouse, Highfield, Ont.; James Henderson, Belton, Ont.

*Thoroughbred:*—William Hendrie, Hamilton, Ont.; Jno. J. Dixon, Toronto, Ont.

*Pony:*—W. J. Stark, Toronto, Ont.; H. J. P. Good, Toronto, Ont.

*French-Canadian Cattle:*—Arsene Denis, St. Norbert Station, Que.; T. B. Macaulay, Montreal, Que.

*French-Canadian Horse:*—Robert Ness, Howick, Que.; J. A. Couture, Quebec, Que.

*Galloway:*—D. McCrae, Guelph, Ont.; Robert Shaw, Brantford, Ont.

*Sheep:*—J. M. Gardhouse, Weston, Ont.; R. H. Harding, Thorndale, Ont.

*Red Polled:*—H. V. Clendenning, Harding, Man.; Dr. A. W. Bell, Winnipeg, Man.

*Swine:*—Joseph Featherstone, Streetsville, Ont.; J. E. Brethour, Burford, Ont.

*Jersey:*—R. J. Fleming, Toronto, Ont.; R. Reid, Berlin, Ont.

*Guernsey:*—H. W. Corning, Cheggogin, N.S.; J. F. Roper, Charlottetown, P.E.I. P.E.I.

*Aberdeen-Angus:*—Samuel Martin, Rounthwaite, Man.; James Bowman, Guelph, Ont.

*Percheron:*—R. P. Stanley, Moosomin, Sask.; George Lane, Calgary, Alta.

*Belgian:*—Paul Tourigny, Quebec, Que.; Arthur Paquette, Quebec, Que.

## RESOLUTION.

*Respecting the Free Admission of Animals for the Improvement of Stock, passed at Annual Meeting of the Record Board, May, 1908, and on which the present Customs Regulations are based.*

That in view of the advisability of having, as far as possible, all pure bred animals in the Dominion of Canada registered in the National Records, and for the protection of importers of pure bred stock, this Board recommends to the Minister



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of Agriculture that in the case of importations for the Improvement of Stock, free Customs entry should be granted only to animals owned and imported by British subjects and on the production of the Certificate of Registration of such animals in one of the Books of Record mentioned in the following list, which list shall be subject to alteration from time to time by authority of the Record Committee. In the case of animals accompanied by Certificates of Registration in any of the Foreign Books of Record contained in this list and for which no corresponding Canadian Record exists, the said certificates to be forwarded to the Accountant of the Canadian National Live Stock Records, who shall examine the same, and on finding them satisfactory, shall attach thereto an Import Certificate bearing his signature and the Seal of the Department of Agriculture.

Regulations based on the above came into force on July 1, 1908, and in February, 1909, were amended as follows, effective March 1, 1909.

#### CONSOLIDATED AND AMENDED REGULATIONS RESPECTING FREE ENTRY OF ANIMALS FOR THE IMPROVEMENT OF STOCK—IN EFFECT MARCH 1, 1909.

Memo. No. 1480-B and Memo. No. 1482-B are hereby cancelled and the following regulations are substituted therefor, in effect March 1, 1909.

Under Order in Council of May 21, 1908, His Excellency the Governor in Council is pleased to order that on and after the 1st day of July, 1908, the regulations established by Order in Council of the 8th November, 1887, respecting "Animals for the improvement of stock," shall be and the same are hereby revoked, and the following regulations prescribed in respect of the free entry under the Customs Tariff of horses, cattle, sheep, goats, asses and swine, for the improvement of stock:—

#### REGULATIONS.

1. No animal imported for the improvement of stock shall be admitted free of duty unless the importer is domiciled in Canada or is a British subject and furnishes a certificate of the record and pedigree in a list of registers designated from time to time by the Minister of Customs, showing that the animal is pure bred and has been admitted to full registry in a book of record established for that breed.

An affidavit by the owner, agent or importer that such animal is the identical animal described in said certificate of record and pedigree must be presented.

2. In case such Certificate is not at hand at the time of the arrival of the animals, the entry for duty may be accepted subject to the refund of the duty upon production of the requisite certificates and proofs in due form satisfactory to the Collector, within one year from the time of entry.

3. The form of Certificate of Record and pedigree to be accepted for the free importation of animals for the improvement of stock, and the Customs procedure in connection therewith shall be subject to the directions of the Minister of Customs.

#### INSTRUCTIONS.

(a) The following is a list of Registers designated by the Minister of Customs, in one of which animals must be registered as pure bred prior to admission free of duty for the improvement of stock, viz.:—

For Holstein-Friesian Cattle.—The Holstein-Friesian Association of Canada, St. George, Ont.

For Horses, Cattle, Sheep, Goats, Asses and Swine (but not including Holstein-Friesian Cattle)—Canadian National Records, Ottawa, Canada, also any Register certified by the Accountant of the Canadian National Records as a recognized book of record in the country of the origin of the breed.



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(b) An Import form of certificate, to be delivered to the Collector of Customs before free entry of animals for improvement of stock is allowed, shall be in one of the forms following, viz.:—

For Holstein-Friesian Cattle:

IMPORT CERTIFICATE.

HOLSTEIN-FRIESIAN ASSOCIATION OF CANADA.

FORM 1.

I hereby certify that the animal (name) . . . . .  
(number) . . . . . is pure bred and is registered in the Holstein-Friesian Herd Book of Canada, the Canadian Book of Record for Holstein-Friesian Cattle.

(Signature) . . . . .  
*Secretary.*

Holstein-Friesian Breeders' Association  
of Canada.

St. George, Ontario . . . . . 19 . . .

For Live Stock other than Holstein-Friesian Cattle:

IMPORT CERTIFICATE.

CANADIAN NATIONAL RECORDS.

FORM 2.

I hereby certify that the animal (name) . . . . .  
(number) . . . . . is pure bred and is registered in the (state  
book of record) . . . . . the Canadian Book of Record  
for (state breed) . . . . .

(Signature) . . . . .  
*Accountant.*

Canadian National Records.

Ottawa, Canada . . . . . 19 . . .

IMPORT CERTIFICATE.

CANADIAN NATIONAL RECORDS.

FORM 2-A.

I hereby certify that the animal (name) . . . . .  
(number) . . . . . is registered in the (state book of record)  
. . . . . the recognized book of record in the country of the  
origin of the breed of (state breed) . . . . .

(Signature) . . . . .  
*Accountant.*

Canadian National Records.

Ottawa, Canada . . . . . 19 . . .

(c) The Import Certificate shall be attached to the free Customs entry for transmission by the Collector to the Department of Customs, Ottawa.

The said Certificate shall be marked in each case with the Customs entry number and the office dating stamp.

*The Collector of Customs shall not demand or accept any certificate as to pedigree, other than in one of the 'Import Certificate' forms herein prescribed.*

(d) Animals may be shipped in bond from the Canadian frontier port to the Customs port of destination subject to quarantine requirements.

(e) Import Certificates for Holstein-Friesian Cattle are issued by the Secretary of the Holstein-Friesian Association of Canada, St. George, Ontario.



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(f) Import Certificates for live stock other than Holstein-Friesian Cattle may be procured on application to 'Accountant,' Canadian National Records, Ottawa, from whom there may also be obtained a list of Canadian Records, lists of recognized foreign records, and other information concerning the importation of pure bred animals for the improvement of stock.

(SGD.) JOHN McDOUGALD,  
*Commissioner of Customs.*

### THE REGULATIONS EXPLAINED.

To obtain free customs entry of an animal of a breed for which there is a Canadian record (other than Holstein-Friesian cattle), the importer must forward to the Accountant, Canadian National Records, Ottawa, the foreign certificates of registration accompanied by the necessary fees for registration as specified elsewhere in this report, and in addition for import certificate a fee of 50 cents for horses and cattle and 10 cents for swine and sheep.

The import certificate will be forwarded to pass customs at the point of entry into Canada or elsewhere as the importer may direct. In no case should the importer present any certificate to the custom authorities other than the import certificate.

Importers should be careful to observe the veterinary requirements in connection with the importation of animals. Full information may be procured from the Veterinary Director General, Ottawa, Canada.

### CANADIAN BOOKS OF RECORD.

#### HORSES.

Name of Breed.	Book of Record.	Name of Association.
Clydesdale .....	Clydesdale Stud Book of Canada.	Clydesdale Horse Association of Canada.
Hackney.....	Canadian Hackney Stud Book...	Canadian Hackney Horse Society.
Shire .....	Canadian Shire Horse Stud Book.	Canadian Shire Horse Association.
Percheron.....	Canadian Percheron Stud Book..	Canadian Percheron Horse Breeders Association.
Thoroughbred .....	Canadian Thoroughbred Stud Book.....	Canadian Thoroughbred Horse Society.
Belgian Draft.....	Canadian Belgian Draft Stud Book	Canadian Belgian Draft Horse Breeders' Association.
French Canadian .....	French Canadian Horse Breeders' Stud Book.....	French Canadian Horse Breeders' Association of Canada.
Shetland, Welsh, New Forest, Polo and Riding, Exmoor and Hackney Ponies.....	Canadian Pony Stud Book ...	Canadian Pony Society.



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CATTLE.

Shorthorn.....	Dominion Shorthorn Herd Book	Dominion Shorthorn Breeders' Association.
Ayrshire.....	Canadian Ayrshire Herd Book..	Canadian Ayrshire Breeders' Association.
Hereford.....	Canadian Hereford Herd Book...	Canadian Hereford Breeders' Association.
Jersey.....	Canadian Jersey Cattle Club Record.....	Canadian Jersey Cattle Club.
Galloway.....	North America Galloway Herd Book ..	North America Galloway Association.
Aberdeen-Angus .....	Canadian Aberdeen-Angus Association's Record.....	Canadian Aberdeen-Angus Association.
Guernsey.....	Canadian Guernsey Herd Book..	Canadian Guernsey Breeders' Association.
French Canadian.....	French Canadian Cattle Breeders' Herd Book.....	French Canadian Cattle Breeders' Association of Canada.
Red Polled.....	Canadian Red Polled Herd Book.	Canadian Red Polled Association.
Holstein-Friesian .....	Holstein-Friesian Herd Book of Canada.....	Holstein-Friesian Association of Canada, St. George.

SWINE.

Yorkshire, Berkshire, Tamworth, Chester White, Poland China, Duroc Jersey, Essex.....	Dominion Swine Breeders' Record	Dominion Swine Breeders' Association.
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SHEEP.

Shropshire, Leicester, Oxford Down, Cotswold, Lincoln, Dorset, Hampshire, Southdown, Suffolk, Cheviot, Blackface....	Canadian National Records.....	Dominion Sheep Breeders' Association.
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FOREIGN BOOKS OF RECORD.

IMPORT CERTIFICATES FOR ANIMALS OF A BREED FOR WHICH THERE IS NO CANADIAN RECORD.

In order to secure the free customs entry for an animal of a breed for which there is no Canadian record but which is recorded in a foreign record recognized as reliable, the importer must forward to the Accountant, Canadian National Records, the foreign certificate of registration accompanied by fees as follows: For horses, cattle or asses, \$1 each; for sheep, swine or goats, 50c. each. The import certificate will be forwarded to pass the customs at the point of entry into Canada or elsewhere as the importer may direct.

In no case should the importer present any certificate to the customs authorities other than the import certificate.

Importers should be careful to observe the veterinary requirements in connection with the importation of animals. Full information may be procured from the Veterinary Director General, Ottawa.



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RECOGNIZED FOREIGN RECORDS.

HORSES.

Name of Breed.	Book of Record.	Name of Association.
Suffolk.....	Suffolk Stud Book.....	Suffolk Horse Society, Suffolk, England.
Cleveland Bay .....	Cleveland Bay Stud Book.....	Cleveland Bay Horse Society of Great Britain and Ireland, Nunthrope, R. S. O., England.
Yorkshire Coach.....	Yorkshire Coach Horse Stud Book	Yorkshire Coach Horse Society of Great Britain and Ireland, Bolton Perdy, R. S. O., England.
Morgan .....	American Morgan Register....	American Morgan Register Association, Middlebury, Vt.
Saddle Horse.....	American Saddle Horse Register	American Saddle Horse Breeders' Association, Louisville, Ky.
American Trotter.....	American Trotting Register.....	American Trotting Register Association, Chicago, Ill.
French Coach.....	Le Studbook Francais, Registre des Chevaux de-demi sang.....	Commission des Studbook des Chevaux de Demi-sang, Paris, France.
German Coach.....	Ostfriesisches Stutbuch.....	Landwirthschaftlichen Hauptverein fur Osfriesland, Norden, Germany.
	Stutbuch der Munsterlandisch-Oldenburgischen Geest.....	Zuchterband des Sudlichen Zuchtgebietes, Oldenburg, Germany.
Oldenburg .....	Oldenburger Stutbuch.....	Verband der Zuchter des Oldenburger eleganten schweren Kutschpferdes, Oldenburg, Germany.
Holsteir Coach .....	Gestutbuch der Holsteinischen Marschen.....	Verband der Pferdezüchter in den Holsteinischen Marschen, Holstein, Germany.
Hunter.....	Hunter Stud Book.....	Hunters' Improvement Society, 12 Hanover Square, London, England.

CATTLE.

Highland.....	Highland Herd Book.....	Highland Cattle Society of Scotland, Inverness, Scotland.
Kerry & Dexter.....	Kerry & Dexter Herd Book.....	Kerry & Dexter Herd Book, Dublin, Ireland.
Sussex.....	Sussex Herd Book .....	Sussex Herdbook Society, London, England.
Devon.....	Davies Devon Herd Book.....	Devon Cattle Breeders' Society, Wiveliscombe, England.
Longhorned Cattle. ....	Longhorned Herd book ..	Longhorned Cattle Society, Atherstone, England.
Welsh Black Cattle.....	Welsh Black Cattle Herd Book..	Welsh Black Cattle Society, Haverfordwest, Wales.
Polled Durham... ..	American Polled Durham Herd Book.....	Polled Durham Breeders' Association, Indianapolis, Ind., U.S.
Polled Hereford.....	National Polled Hereford Herd Book .....	National Polled Hereford Breeders' Association, Chicago, Ill., U.S.



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## SWINE.

Name of Breed.	Book of Records.	Name of Association.
Large Black Pig .....	Large Black Society Herd Book.	Large Black Pig Society, Ipswich, England.
Lincolnshire Curly Coated Pig...	Curly Coated Pig Breeders' Herd Book.....	Lincolnshire Curly Coated Pig Breeders' Association, Thornhayaes, England.

## SHEEP.

Kent or Romney Marsh.....	Kent or Romney Marsh Flock Book .....	Kent or Romney Marsh Sheep Breeders' Association, London, W. C., England
Wensleydale Longwood.....	Wensleydale Flock Book.....	Wensleydale Longwool Sheep Breeders' Association, Yorkshire, England.
Wensleydale Bluefaced.....	Wensleydale Bluefaced Flock Book ...	Incorporated Wensleydale Bluefaced Sheep Breeders' Association and Flock Book Society, Caperby, England.

## GOATS.

Goats.....	British Goat Society Herd Book.	British Goat Society, Kingston on Thames, England.
Toggenburg.....	Toggenburg Herd Book.....	Toggenburg Club, Beefolds, Farnham, England.

## ASSES.

Jacks and Jennets ..	Studbook Mulassier .....	Société Centrale d'Agriculture des deux Sevres
Jacks and Jennets .....	Studbook of Jacks & Jennets of Spain.....	.....

## APPLICATIONS FOR CANADIAN REGISTRATION AND IMPORT CERTIFICATE.

In the case of cattle, sheep and swine from European countries the importer need not make application for registration and import certificate until the animals arrive at quarantine, as the quarantine period allows ample time to secure certificates before having to pass the customs.

In the case of horses from European countries the importer should, if possible, forward his foreign certificates, along with application and fees, on a mail boat sailing before the stock is shipped. Import certificates and Canadian certificates of registration can then be sent to meet the horses on landing. The Canadian certificate is necessary in order to get the reduced railway rates. In the case of late purchases, importers landing horses at Montreal or at St. John, or other Atlantic ports, may mail applications, foreign certificates and fees on landing and then ship in bond subject to quarantine requirements, to the nearest custom house to destination. It must in all cases be definitely stated where import certificates are to be forwarded.

In addition to the foreign certificate of registration, an application made out on



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the regular form, supplied by the National Record Office, is required. Fees for registration are indicated elsewhere in this report.

For animals imported in dam certificates of service must be procured from the breeder signed by the owner of the sire at the time of service.

The National Record Office gives special service in issuing certificates urgently needed. The certificates will be mailed to the importer in care of the customs officer at the port of entry or other address indicated.

It is the purpose of the Record Committee to watch carefully the importations of animals for which there are no Canadian records, and when a sufficient number of a breed are being bred in Canada to warrant the opening of a record, steps will be taken to organize a Record Association with the least possible delay.

Canadians wishing to import pure bred animals from the United States, in order to avoid delay and trouble at the port of entry should secure registration of the animals in the Canadian record and import certificate before the animals are shipped.

In the case of swine from the United States, which the present health regulations require to be quarantined, the registration of animals may, if desired, be deferred until after the animals are in quarantine.

It will be observed from paragraph 1 of the regulations that only British subjects or persons domiciled in Canada are entitled to the privilege of free entry of animals for the improvement of stock. This does not apply to settlers who are accorded certain privileges in regard to the bringing in of settlers' effects.

## ELIGIBILITY OF ANIMALS FOR CANADIAN RECORDS.

It is important that Canadian importers, before purchasing animals of a breed for which there is a Canadian record, ascertain if they are recorded in the proper foreign record, and if so, if they are eligible for record in Canada. Canadian registration of imported animals will not be made unless proper foreign certificate is presented.

Canadian records, with the exception of those for French-Canadian cattle and French-Canadian horses which are purely Canadian, are for the most part based on the records of the countries of the origin of the breeds, but as the Canadian standard of registration is higher in some cases than the standard in the country of origin, or that of other countries, animals may or may not be eligible for entry in the Canadian records. The following will assist in arriving at the eligibility of an animal. The fees for recording animals in the Canadian records bred in other countries are indicated in each case. (These fees do not in all cases apply to the recording of Canadian bred animals.) In addition to the registration fee, 50c. is charged for import certificate for horses and cattle and 10c. for sheep and swine.

### HORSES.

#### CLYDESDALE.

Animals recorded and numbered in the Clydesdale Stud Book of Great Britain and Ireland are eligible, provided their sires and dams and grand sires and grand dams are also recorded and numbered therein. The breeding of many horses recorded in the Scottish Book does not come up to this standard.

Animals recorded in the American Clydesdale Stud Book, if American bred or descended from imported stock, are eligible, providing their breeding complies with the Canadian standard of registration. Fees to members—animals imported from Great Britain, stallions \$3, mares \$2. To non-members, stallions \$4, mares \$3. To members—animals bred in and imported from the United States \$1; to non-members \$2. An additional fee of \$1 is charged for each American bred ancestor and the fees above stated for ancestors imported from Great Britain. Annual membership \$2.



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## HACKNEY.

Stallions full registered and all mares recorded in the English Hackney Stud Book and all animals recorded in the American Hackney Stud Book. Fees to members \$2, to non-members \$4. An additional fee of \$1 is charged for each ancestor recorded to complete pedigrees of animals recorded in the American Stud Book. Annual membership \$3.

## SHIRES.

All animals recorded in the English Shire Horse Stud Book or in the American Shire Horse Stud Book. Fees to members—animals under three years of age \$1, animals over three years of age \$2; to non-members—animals under three years of age \$2, animals over three years of age \$4. An additional fee of \$1 is charged for each ancestor recorded to complete pedigrees of animals recorded in the American Stud Book.

## PERCHERON.

All animals recorded in the Stud Book Percheron de France or in the American Percheron Stud Book. Fees to members—stallions \$3, mares \$1; to non-members—stallions \$5, mares \$2. An additional fee of 50c. is charged for each ancestor recorded to complete pedigrees of animals recorded in the American Percheron Stud Book (Chicago). Annual membership \$2.

## THOROUGHBRED.

All animals recorded in the General Stud Book (Great Britain), American, French or Australian Stud Books. Fees to members \$1, to non-members \$2. Annual membership \$2.

## BELGIAN.

All animals recorded in the Stud Book des Chevaux de Traits Belges or in the American Register of Belgian Draft Horses. Fees to members—stallions \$3, mares \$1; to non-members—stallions \$4, mares \$2. An additional fee of 50c. is charged for each ancestor recorded to complete pedigrees of animals recorded in the American Stud Book. Annual membership \$2.

## SHETLAND PONIES.

All animals recorded in the Shetland Stud Book of Scotland and such animals recorded in the American Shetland Pony Stud Book as trace to ancestors recorded in the Shetland Stud Book of Scotland. Fees to members \$1, to non-members \$2. Annual membership \$2.

## WELSH PONIES.

All animals recorded in the Welsh Pony and Cob Stud Book (Great Britain), or in the American Welsh Pony and Cob Stud Book. Fees same as Shetland ponies.

## NEW FOREST PONIES.

Animals imported from Great Britain recognized as pure bred. A certificate to this effect must be furnished, signed by the breeder and certified by the Secretary of the Association for the improvement of the breed of New Forest ponies (Great Britain). Fees same as Shetland ponies.

## POLO AND RIDING PONIES.

All animals recorded in the Polo Section of the Polo and Riding Pony Stud Book (Great Britain). Fees same as Shetland ponies.



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## EXMOOR PONIES.

Animals imported from Great Britain bred by reputable breeders. Certificate of breeding signed by breeder must be furnished. Fees same as Shetland ponies.

## HACKNEY PONIES.

All stallions full-registered and all mares recorded in the English Hackney Stud Book and all ponies recorded in the American Hackney Stud Book. Fees to members \$1, to non-members \$2. Annual membership \$2.

## CATTLE.

## SHORTHORN.

Animals recorded or eligible for record in the fortieth or preceding volumes of Coates English Herd Book. Animals recorded in the American Shorthorn Herd Book providing they trace in all their crosses to named ancestors imported from Great Britain. The breeding of such animals, however, must be of the standard required by the rules of entry of the Dominion Shorthorn Breeders' Association. Many animals on record in the American Shorthorn Herd Book are not eligible for entry in the Dominion Shorthorn Herd Book. Fees to members—English animals 75c., American animals 75c.; to non-members—English animals \$1.25, American animals \$1.25. An additional fee of 50c. is charged for each ancestor recorded to complete pedigrees of animals recorded in the American Herd Book. All crosses back to and including those imported from Great Britain must be recorded. Annual membership \$2.

## AYRSHIRE.

All animals recorded in the Herd Book of the Ayrshire Cattle Herd Book Society of Great Britain and Ireland. All animals recorded in the American Ayrshire Herd Book. Fees to members—animals bred in Great Britain or Ireland \$1, American bred animals \$1; to non-members—animals bred in Great Britain or Ireland \$2, American bred animals \$2. Additional fees as follows are charged for ancestors recorded to complete pedigrees of animals recorded in the American Book. All animals back to and including those imported from Great Britain must be recorded. For ancestors owned by applicant \$1, for ancestors not owned by applicant 25c. Annual membership \$2.

## HEREFORD.

All animals recorded in the English Hereford Herd Book. All animals recorded in the American Hereford Herd Book. Fees to members—animals imported from Great Britain 75c., animals imported from the United States 75c.; to non-members—animals imported from Great Britain \$2, animals imported from the United States \$2. Additional fees as follows are charged for recording ancestors to complete pedigrees of animals recorded in the American Book. All ancestors back to and including those imported from Great Britain must be recorded. To members resident in Canada 50c. each, to members resident in the United States 75c. each; to all non-members \$2 each. Annual membership \$2.

## JERSEY.

All animals recorded in the Island of Jersey Herd Book. Animals recorded in the English Jersey Herd Book providing they trace in all their crosses to animals recorded in the Island of Jersey Herd Book. Importers of Jerseys from Great Britain or the Island of Jersey must comply with the import regulations of the Canadian



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Jersey Cattle Club, which will be supplied on application. Fees to members—animals imported from Great Britain or the Island of Jersey \$1, animals bred in the United States and recorded in the American Book 50c.; to non-members—animals imported from Great Britain or the Island of Jersey \$1.50, animals bred in the United States and recorded in the American Book \$1. Animals bred in the United States not recorded in the American Book—to members \$1, to non-members \$1.50, if under two years of age, if over two years of age \$1.50 and \$2 respectively. Annual membership \$1.

## GALLOWAY.

Animals recorded in the Galloway Herd Book of Great Britain or the American Galloway Herd Book. Fees to members—animals under six months of age 50c., animals over six months of age \$1; to non-members—animals under six months of age \$1, animals over six months of age \$1.50. Annual membership \$1.

## ABERDEEN-ANGUS.

Animals recorded in the Polled Herd Book (Scotland), or in the American Aberdeen-Angus Herd Book. Fees to members—animals under one year of age \$1, animals over one year of age \$2; to non-members—animals under one year of age \$3, animals over one year of age \$5. Annual membership \$2.

## GUERNSEY.

Animals recorded in the Herd Book of the Royal Guernsey Agricultural Society, the General Herd Book of Guernsey, or in the Herd Book of the English Guernsey Cattle Club Herd Register. Animals recorded in other than the Island of Guernsey Record must trace in all their crosses to animals imported from the island. Fees to members \$1, to non-members \$2. Annual membership \$1.

## RED POLLED.

Animals recorded in the Red Polled Herd Book of Great Britain or in the American Red Polled Herd Book. Fees to members \$1, to non-members \$2. Annual membership \$2.

## SWINE.

## YORKSHIRE.

Animals recorded in the Large White Section of the English National Pig Breeders' Association Herd Book or in the American Yorkshire Record. Fees to members 50c., to non-members \$1. An additional fee of 50c. to members and \$1 to non-members is charged for each ancestor recorded to complete pedigrees of animals recorded in the American Book. All ancestors back to and including those imported from Great Britain must be recorded. Annual membership \$2.

## BERKSHIRE.

Animals recorded in the British Berkshire Herd Book or in the American Berkshire Record. Fees same as Yorkshire, including charges for recording ancestors in American Book.

## TAMWORTH.

Animals recorded in the Tamworth Section of the English National Pig Breeders' Association Herd Book or in the American Tamworth Swine Record. Fees same as Yorkshire, including charges for recording ancestors in American Book.



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## ESSEX.

Animals recorded in the American Essex Record. Fees same as Yorkshire, including charges for recording ancestors in American Book.

## POLAND CHINA.

Animals recorded in the American Poland China Record or in the National Poland China Record. Fees to members 50c., to non-members \$1. Annual membership \$2.

## CHESTER WHITE.

Animals recorded in Todds Improved Chester White Record, National Chester White Record, International Ohio Improved Chester White Record, Ohio Improved Chester White Swine Breeders' Association Record, Chester White Record Association of Indiana and the Standard Chester White Record Association. Fees same as Poland China.

## DUROC JERSEY.

Animals recorded in the American Duroc Jersey Record. Fees same as Poland China.

## SHEEP.

## SHROPSHIRE.

Animals recorded in the English Flock Book of Shropshire Sheep or in the American Shropshire Sheep Record. Fees to members of the American Shropshire Registry Association, for animals imported from Great Britain 50c., for animals bred in the United States 50c.; to non-members—for animals imported from Great Britain \$2, for animals bred in the United States \$1. Life membership fee to American Shropshire Registry Association \$5. Annual membership fee to Dominion Sheep Breeders' Association \$1.

## LINCOLN.

Animals recorded in the Lincoln Longwool Sheep Breeders' Flock Book or in the American National Lincoln Sheep Breeders' Record. Fees to members 50c., to non-members \$1. Annual membership \$1.

## OXFORD DOWN.

Animals recorded in the English Oxford Down Flock Book or in the American Oxford Down Record. Fees same as Lincoln.

## COTSWOLD.

Animals recorded in the English Cotswold Flock Book or in the American Cotswold Record. Fees same as Lincoln.

## DORSET

Animals recorded in the English Dorset Horn Flock Book or in the American Continental Dorset Club Record. Fees same as Lincoln.

## SOUTHDOWN.

Animals recorded in the English Southdown Flock Book or in the American Southdown Record. Fees same as Lincoln.



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## HAMPSHIRE DOWN.

Animals recorded in the English Hampshire Down Flock Book or in the American Hampshire Down Flock Record. Fees same as Lincoln.

## LEICESTER.

Animals recorded in the English Leicester Flock Book, the English Border Leicester Flock Book or in the American Leicester Record. Fees same as Lincoln.

## HIGHLAND BLACKFACE.

Animals imported from Great Britain from flocks recognized as pure bred. A certificate to this effect must be furnished certified by the Secretary of the Blackface Sheep Breeders' Association. Fees same as Lincoln.

## CHEVIOT.

Animals recorded in the English Cheviot Sheep Flock Book or in the American Cheviot Flock Book. Fees same as Lincoln.

## SUFFOLK.

Animals recorded in the English Suffolk Flock Book or in the American Suffolk Sheep Record. Fees same as Lincoln.

Blank application forms and other information, if desired, will be furnished on application to the Accountant National Live Stock Records, Ottawa, Canada.

OTTAWA, Canada, February 1, 1909.

## ACT OF INCORPORATION.

The following is a copy of the Dominion Act providing for the incorporation of Live Stock Record Associations.

## AN ACT RESPECTING THE INCORPORATION OF LIVE STOCK RECORD ASSOCIATIONS.

1. This Act may be cited as the Live Stock Pedigree Act.

2. Any five or more persons who desire to associate themselves together for the purpose of keeping a record of pure-bred live stock of any distinct breed or several records each of a distinct breed of the same class of animals, may make application, in the form A in the schedule of this Act, to the Minister of Agriculture for incorporation.

(2) Such application shall be in duplicate, and shall include a copy of the proposed constitution, by-laws and rules of the association.

(3) The signatures to the application shall be verified by the affidavit of a subscribing witness thereto, before a notary public, commissioner for taking affidavits or justice of the peace. 63-64 V., c. 33, s. 1.

3. If the Minister approves of the application, he shall cause one of the duplicates thereof to be registered in the Department of Agriculture, and the other to be returned to the applicants with a certificate endorsed thereon and signed by him, in the Form B in the schedule to this Act. 63-64 V., c. 33, s. 2.

4. Thereupon, from the date of such certificate, the applicants and such other persons as become members of the association shall be a body corporate and politic by the name specified in the application, with the constitution, by-laws and rules included therein, and with power to hold such property as is required for the carrying on of the business of the association. 63-64 V., c. 33, s. 3.



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5. Not more than one association for each distinct breed of horses, cattle, sheep or swine shall be incorporated under this Act. 63-64 V., c. 33, s. 4.

6. The constitution, by-laws and rules of the association shall provide for,—

- (a) the registration of pedigrees of pure-bred live stock;
- (b) the suspension and expulsion of members;
- (c) the election of officers and their duties, and the filling of vacancies;
- (d) the mode of convening annual, general and special meetings;
- (e) the audit of accounts;
- (f) the location of the head office and of the branch offices, if any.

(g) The Constitution, by-laws and rules may also provide for the exercise, in conjunction with any other association or associations incorporated under this Act, of any of its powers or functions through a common officer or officers to be appointed by such associations. 63-64 V., c. 33, s. 5; 4-5 E. VII., c. 21, s. 1.

7. The constitution may be altered and any by-law or rule may be altered or repealed at a meeting of the association called for that purpose, but no such alteration or repeal shall have force or effect until it has been approved by the Minister and registered in the Department of Agriculture. 63-64 V., c. 33, s. 6.

8. The association shall cause a book to be kept by the secretary at the head office, and by an assistant secretary at each branch office, wherein shall be written a copy of the constitution, by-laws and rules.

(2) Persons becoming members of the association may examine the said books. 63-64 V., c. 33, s. 7.

9. The association may consist of annual subscribers and life members, and the annual and life membership fees shall be fixed by the members at the annual meeting or at a meeting of the association called for that purpose.

(2) Any person who has not been expelled from the association may become a member thereof by giving or sending his name and address to the secretary, together with the annual or life membership fee; and such person shall thereupon be entitled to the rights and privileges, and subject to the liabilities of a member as fully as if he had signed the application for the incorporation of the association. 63-64 V., c. 33, s. 8.

10. The constitution, by-laws and rules of the association shall bind the association and the members thereof to the same extent as if each member had subscribed his name and affixed his seal thereto. 63-64 V., c. 33, s. 9.

11. The liability of each member shall be limited to the amount of his membership fees due. 63-64 V., c. 33, s. 10.

12. At the annual meeting the retiring officers shall present a full report of their proceedings and of the proceedings of the association, and a detailed statement, duly audited, of the receipts and expenditures for the previous year, and of the assets and liabilities.

(2) A copy of the said report, with a list of the members and their addresses and a list of the officers elected, shall be sent by the secretary to the Minister within twenty days after the annual meeting. 63-64 V., c. 33, s. 11.

13. If the association ceases for twelve consecutive months to do business as required by its constitution, by-laws and rules, or if the Minister is satisfied, after an inquiry at which the association was given due notice to appear, that the business of the association is not being properly conducted, the Minister may declare the corporate powers of the association forfeited. 63-64 V., c. 33, s. 12.

14. Any person who signs a false pedigree intended for registration, or who presents or causes another person to present a false pedigree for registration by the association, shall, upon summary conviction, upon information laid within two years from the commission of the offence, be liable to a penalty not less than one hundred dollars and not exceeding five hundred dollars for each false pedigree so signed or presented, together with the costs of prosecution. 63-64 V., c. 33, s. 13.



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15. At the request of any association incorporated under this Act, authorized at the annual meeting or at a meeting called for that purpose, the Minister of Agriculture may, through an officer of his department, thereunto authorized by him, approve, under the hand of that officer and the seal of his department, or such other seal as is adopted for that purpose, the certificates of registration issued by such association. 4-5 E. VII., c. 21, s. 2.

## APPLICATION FOR INCORPORATION.

We, the undersigned, hereby apply for incorporation as an association under the provisions of the Live Stock Pedigree Act.

The name of the association is to be (*name of association*), and the object for which it is to be formed is to keep a record of the pedigrees of pure-bred (*name of breed*), and to collect, publish and preserve reliable and valuable data concerning that breed.

The names and addresses of the officers of the association are (*names and addresses in full.*)

The constitution, by-laws and rules of the association are as follows: (*Insert constitution, &c., at length.*)

Dated at \_\_\_\_\_, the \_\_\_\_\_ day of \_\_\_\_\_.

*Signatures of Applicants.*

I, the undersigned, solemnly swear that I know (*mentioning the names of the signers known to him*) and that they severally signed the foregoing application in my presence.

Sworn before me, at \_\_\_\_\_, this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_. } (*Signature.*)

A. B.

## THE MINISTER'S CERTIFICATE.

I certify that the within application is approved this \_\_\_\_\_ day of \_\_\_\_\_, 19\_\_\_\_, in pursuance of the Live Stock Pedigree Act.

C. D.,  
*Minister of Agriculture.*

63-64 V., c. 33, sch. B.



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## APPENDIX No. 17.

OTTAWA, October 31, 1908.

SIR,—I have the honour to transmit herewith a copy of a paper read by me at the recent International Congress on Tuberculosis held at Washington, D.C.

In this paper I have confined myself to that phase of the question set forth in the title, viz., 'The Control of Bovine Tuberculosis,' refraining almost entirely from any mention of measures for the protection of the public against possible infection from bovine sources.

Of the two problems connected with bovine tuberculosis, namely, the eradication of the disease from the herds of a country and the protection of the human race from bovine infection, the latter is by far the most simple and easy of solution.

Under the system now followed in Canada, matters of this nature are properly dealt with by the public health authorities operating under provincial laws which, in cases where this has not been already done, can easily be so amended as to furnish the powers necessary for the absolute control of the situation as regards the supply of milk and meat, these products being, needless to say, the most important agents in the communication of tuberculosis from animals to man.

Danger from the first mentioned source can be practically eliminated by providing for the regular veterinary inspection and testing with tuberculin of all herds supplying milk for human consumption; animals reacting to the test or, even in default of reaction, showing clinical evidence of being affected with tuberculosis, to be permanently ear-marked and the use of their milk for human food absolutely prohibited.

This course has been followed in some communities in Manitoba for a considerable time by virtue of amendments made, many years ago, to the Municipal Act of that province.

Similar regulations are in force in several communities in other provinces and I may remind you that, with the view of encouraging and assisting the effects of municipal authorities in this direction, this branch of your department supplies tuberculin, free of charge, for the use of duly qualified veterinarians, on condition that reports of all tests made are promptly furnished and that reacting animals are properly earmarked.

The meat supply can be similarly safe-guarded by the abolition of the secret and unsanitary private slaughter-houses and the substitution therefor of municipal abattoirs conducted under the supervision of specially trained and qualified veterinary inspectors as is now done, under the provisions of the Meat and Canned Foods Act, in all establishments engaged in the export or interprovincial meat trade.

A satisfactory, practical solution of the wider problem of the complete eradication of bovine tuberculosis has yet to be found.

While I regret that I am not, at present, in a position to recommend any definite policy with this end in view, I have, in the accompanying paper, made some tentative suggestions as to the lines which, with our, even yet, very imperfect knowledge of the subject, it would, in my opinion, be reasonably safe to follow.

Meanwhile, I am watching very closely the more or less experimental policies adopted, from time to time, by other countries, as also the earnest and painstaking work of the many veterinary scientists who, in various parts of the world, are striving to discover some reasonable method of effectively stamping out the disease.



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The unfortunate and, in some cases, utterly discouraging results which have followed hasty and ill-digested legislation in other countries indicate that, in dealing with this much vexed question, it is advisable to make haste slowly and to be at least reasonably certain of success, before committing the Dominion to the large expenditures involved in an undertaking of such magnitude.

I have the honour to be, sir,

Your obedient servant,

J. G. RUTLERFORD,

*Veterinary Director General and Live Stock Commissioner.*

The Honourable,

The Minister of Agriculture.

### THE CONTROL OF BOVINE TUBERCULOSIS.

*A Paper read before Section VII. of the International Congress on Tuberculosis, at Washington, D.C., on October 1, 1908.*

MR. PRESIDENT,—It would be most unbecoming in me, following the various distinguished speakers who have taken part in the discussions of this Congress, and especially at this late date in the proceedings, to occupy any great length of time in laying before its members the few ideas on the control of Bovine Tuberculosis which I have been able to put together in the limited period at my disposal.

I observe that on the official programme the subject assigned to me is the 'Control of Bovine Tuberculosis in Canada,' the last two words having been added to the title originally sent in by me.

I have but little to say on the control of bovine tuberculosis in Canada, inasmuch as while in some districts, under municipal and provincial laws, efforts are being made to control the disease in dairy herds supplying various centres of population, very little is now being done by the federal government through the Health of Animals Branch of the Department of Agriculture, which is in my charge.

Although for some years, at a period prior to my assuming office, a very considerable amount of testing with tuberculin upon the application of owners was carried on, no appreciable benefit was found to result, and as a matter of fact, we now confine ourselves to the testing of cattle imported or exported for breeding purposes, those on the Experimental Farms, and a few other herds which have been placed by their owners under the direct control of our officers.

We, however, on the request of owners of cattle who desire them tested, supply tuberculin free of charge to any reputable qualified veterinary surgeon, on condition that he will send to the department the results of the tests made by him, on charts which we furnish for that purpose.

All cattle reacting to tuberculin in Canada, save those privately tested, are permanently earmarked by cutting a large T out of the right ear.

I may as well frankly state that the reason for this apparent inertia is that, so far, no satisfactory intelligent method of dealing with bovine tuberculosis has been evolved and we deem it wiser, before taking action, to await the results of the investigations now being conducted by veterinary scientists in various countries, in the hope that some better way of dealing with the problem may be discovered.

Our knowledge of tuberculosis, the tuberculin test, and of their vagaries, has all along been defective and incomplete and undoubtedly is so to-day, and when we bear in mind the many legislative mistakes which, owing to this lack of exact knowledge, have been made in the past, it must be admitted that caution is commendable, and that, before taking any definite departmental action involving the large interests



which are at stake in such a country as Canada, it is reasonable that we should 'look before we leap,' and guard, as far as may be, against the possibility of having to recede, more or less ignominiously, from a position once taken.

Many of our medical friends and some veterinarians whose zeal outruns their discretion, advocate compulsory testing and the slaughter of all reacting animals. At first sight, to men lacking practical experience and perhaps devoid of responsibility, this policy may appear a very simple solution of the problem. That it is very far from being so, however, needs but little demonstration to an audience of this nature. All practical veterinary sanitarians, dealing in large matters, are, even without taking into consideration the painful experience of those communities which in earlier days were rash enough to adopt it, well aware, not only of the great difficulties to be encountered in carrying out such a policy, but of the fact that under ordinary circumstances, in spite of the great economic waste involved, its results are by no means so satisfactory as its advocates would like to have us believe.

Most of us can remember the time when the majority of veterinarians, many of whom should have known better, believed that if a herd of cattle were tested, the reactors destroyed and the premises disinfected, the disease was stamped out and the owner might thereafter be left to follow his own courses.

Intelligent men have, of course, understood from the beginning that there must be, in the very nature of things, a period of latency or incubation between the time of infection and that when an infected animal would react to tuberculin. This period was fixed in 1899 and 1900 by contemporaneous but entirely independent experiments, carried on by the Tuberculin Committee of the Royal Agricultural Society of England and by Drs. Nocard and Rossignol, under the auspices of the Société de Médecine Vétérinaire Pratique of France. The results in both cases were practically the same and showed the period of incubation, while depending somewhat upon the mode and degree of infection, to range from eight to fifty days.

This fact, affecting vitally as it does both the original herd and any additions or replacements which may be made, is in itself a very serious obstacle to the satisfactory working out of a policy of compulsory testing and slaughter, even with liberal compensation. Taken in conjunction with the vagaries of tuberculin, especially on second, third and fourth tests in the same herds, and the numerous ingenious methods adopted by owners, especially of pure bred cattle, in order to defeat the test, it is sufficient to exclude from the field of practical action this method of dealing with tuberculosis, except in small and circumscribed communities, in which all, or at least a majority of the owners are alive to the necessity of stamping out tuberculosis and are willing to co-operate heartily with the authorities in bringing about that result.

This conclusion on my part has not been rashly arrived at. Ever since tuberculin was first used as a diagnostic agent in bovine tuberculosis I have been studying its action and during the whole of that period my opportunities for such study have been considerably greater than fall to the lot of the average veterinarian.

Let us go a little more into detail. A herd of, say one hundred cattle, kept under ordinary stable conditions is tested and twenty-five reactors are found. These twenty-five animals, together with any which, owing to the disease being in an advanced stage, may fail to react but which are detected by clinical examination, are slaughtered and the premises carefully disinfected. It is not so very long, as I have already said, since many veterinarians were teaching that such a herd was safe and sound and that provided any animals added were carefully tested before being brought into contact, no further danger need be apprehended. This is, of course, very far from being the case.

In the first place a retest after three months will, depending to some extent on the virulence of the particular infection, a point of great importance, and the sanitary conditions, reveal perhaps from five to ten new reactors. Even after these have been destroyed and the premises again disinfected the herd is by no means safe. The



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ten reactors, taking that as the number, have been living in close contact with the remaining sixty-five and it is quite likely that three months later, several of the latter will be found to be affected. Here also comes into play the uncertainty of tuberculin in repeated tests, a most serious consideration, especially where doubtful reactions are concerned. In spite of Professor Vallé's important and valuable discovery, which I may say does not by any means apply in all cases, it is quite within the bounds of possibility that a number of animals, affected to a greater or less degree, will fail to react when tested for the third or fourth time. This acquired tolerance to tuberculin is one of its most serious limitations and constitutes another difficulty somewhat hard to overcome. Let us admit, however, that after the lapse of a longer or shorter period and a number of carefully conducted retests, the survivors of the original herd are properly pronounced healthy.

We must now take into consideration the question of additions and replacements, one which, from a business standpoint, is, in the majority of instances, of paramount importance to the owner. It is not enough to have the new animals tested before bringing them on to the premises. The same limitation, viz., that of the incubative period, applies to such tests as to those with which we have been dealing. New arrivals must be isolated, not only from the original herd but from each other, and submitted to a retest at the expiry of at least three months before being allowed to come in contact with any other cattle.

Two further points here demand our attention. We have hitherto, presumably, been speaking of tests honestly applied to the cattle of an honest owner and by a capable, intelligent and experienced veterinarian. We must now first consider some of the nefarious methods employed by dishonest and unprincipled owners to nullify the test and so defeat the end in view.

The old method of dosing beforehand with tuberculin, although still followed in many herds, has largely lost its value through the discovery of Professor Vallé above referred to, and is now, as a rule, only employed when the testing veterinarian is agreeably complacent, or a few years behind his age. It has, among the more astute breeders and dealers, been largely superseded by the practice of administering one or other of the modern antipyretics, combined for the sake of safety with other drugs, to such animals as are known to be tuberculous, or which show any rise of temperature when undergoing the test.

This plan is beautiful in its simplicity. Temperatures are quietly taken from half an hour to an hour before the veterinarian makes his rounds and the febrifuge, mixed with a little sugar and disguised in a handful or two of meal, is licked up by the animal without fuss or trouble. There is no drenching, no handling, no excitement, the temperature drops and although there may be and often is thermal irregularity, there is no distinct rise and above all no tuberculin arch.

This brings us to the second of my two further points, viz., the veterinarian making the test.

While, with all its limitations, I have great confidence in the diagnostic properties of tuberculin, I must confess to a feeling of suspicion with reference to all charts that are in any degree, which I may term colourless, unless I know that the man who signs them is an honest, conscientious, wide-awake and experienced veterinarian. Too many men take it for granted that everything is fair and above board, and depending entirely on their thermometer readings, allow themselves to be hoodwinked by dishonest and unscrupulous owners. I could go into many details and perhaps furnish some amusement by recounting a few of the artful dodges resorted to in order to keep the veterinarian away from his cattle between temperatures so as to permit of their being safely manipulated, but time will not permit.

One thing, however, should be emphasized, viz., the fact that in the overwhelming majority of cases we have, in addition to the temperature rise, a distinct clinical reaction, some of the most salient features of which may be and often are only



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temporary, while others persist until at least twenty-four hours after injection. Among the temporary signs which may be noticed, as a rule, from six to twelve hours after injection, are in severe cases, rigours, often accompanied by staring coat, general excitation and frequently diarrhoea. In less well marked cases we have coldness over the loins, quarters, thighs and tail, sub-acute excitation and general malaise. Even when these symptoms have passed off the animal maintains a standing posture and is more or less stiffened; there is loss of appetite, rumination is suspended, and in milch cows the flow of milk is diminished.

Close attention to and observation of the animals undergoing the test are, in my opinion, indispensable. Even with them it is possible for mistakes to be made; without them the tuberculin test is very apt to be badly discredited.

The older veterinarians here will recollect that, prior to the discovery of tuberculin, much attention was paid, both by teachers and practitioners, to the clinical diagnosis of bovine tuberculosis. Of late years this phase of practice has been almost entirely lost sight of, the younger men practically depending on tuberculin as a diagnostic. This state of affairs is regrettable and should be remedied by cultivating, with regard to cases of tuberculosis, that habit of painstaking observation which alone makes for success in the diagnosis of most of the other maladies to which dumb animals are subject.

I might perhaps explain that the foregoing remarks on the necessity of care and exactitude in making tests are intended to emphasize the idea that only skilful and specially trained men can with safety be employed in this work, no small difficulty in itself, when it comes to undertaking a universal and compulsory testing policy.

There is still more to be said against compulsory testing and slaughter. Many reactors are but slightly affected, and while in the case of beef cattle in good condition the loss from their slaughter may be insignificant, it is a very different matter when valuable pure-bred herds or even common grade stock, thin in flesh, are condemned. It is true that with the latter the question of compensation may be more easily settled than with the former, but the matter of economic waste is only one of degree, for while the pure-bred reactors might live out their natural lives and produce much valuable and, with proper precautions, healthy stock, the thin grades might be fattened and slaughtered under careful supervision for purposes of human food.

For the reasons given above I am convinced that, at least on any large scale, the policy of compulsory testing and slaughter is not a practicable one.

Turning to the policy of voluntary testing, or testing in response to applications from owners, now followed in certain of the United States and in several of the countries of Europe, I would point out that not only do most of the arguments against compulsory testing apply to it with equal force, but several other factors come up for consideration. Among these perhaps the most important is the fact that in testing only those herds in a country which are voluntarily submitted to the authorities, the progress made in the direction of eradicating tuberculosis must, of necessity, be not only very slow but very uncertain. Even Professor Bang admits that, under the experience of repeated and often disappointing tests, the patience and courage of our Danish friends not unfrequently fail and they become weary of well-doing and relapse into carelessness.

This phase of the matter is one which must be taken into account and when with it is considered the fact that the last to ask for the test are, as a rule, the breeders of pure-bred stock, whose herds are the principal agents in disseminating disease, the ultimate ineffectiveness of voluntary testing is pretty clearly demonstrated. Owners must obtain fresh blood from time to time and unless a man is heart and soul with the authorities in their efforts to clean up his herd and takes every possible and minute precaution accordingly, it is, so long as tuberculosis



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exists in the country, only a matter of time until his stock relapses into a condition of disease.

In this connection I have read with much interest the plan proposed by Dr. Niven, Medical Health Officer of Manchester, and supported by Professor Delapine and Mr. Brittlebank, the chief veterinary officer of that city, which includes the forming of disease-free islands by eradicating tuberculosis from certain farms and gradually extending the work over small districts, to be still further enlarged as the system finds favour with stock owners.

While there are some features of the scheme, such as the spending of public money in specially selected localities to the exclusion of other tax-payers and the supplying of sanitary buildings, through bringing pressure to bear on landlords or otherwise, which are scarcely applicable to conditions in America, it is, in my opinion, much more sensible and likely to be productive of ultimate benefit than the diffuse policy of promiscuously testing a herd here or there over an extensive territory, difficult, if not impossible, to keep under observation or control without an enormous staff of well trained, experienced and absolutely conscientious veterinary inspectors, having no interest, beyond that of duty, in the herds with which they are called upon to deal or their owners. I might here say that the policy of employing local practitioners for this work has been repeatedly tried and, in my experience at least, has not in the majority of instances proved either beneficial or successful.

I have nothing to say against the Bang system itself; in fact I am, and always have been, one of its most consistent advocates and admirers. I cannot, however, after thirty years experience as a veterinarian and with the knowledge, acquired in that time, of conditions on the ordinary North American farm, bring myself to believe that it is capable of successful general application on this continent.

There is no doubt that if all our stock owners were thoroughly intelligent, well informed, anxious to rid their herds of tuberculosis and gifted with an infinite capacity for taking pains, either the Bang system or that of Ostertag might be adopted with every hope of a successful issue. As matters stand, we must, in order to deal with bovine tuberculosis effectively, have some definite policy of legal control and the question, to my mind, is whether or not such control can properly be based on the tuberculin test.

At present I am inclined to favour a combination of the system of Bang and Ostertag with that of the Manchester men, accompanied by a closer supervision of infected herds than is recommended by either of the two first named authorities, so far as I understand their methods.

All clinical or, if they can be detected, open cases of tuberculosis, should be destroyed; all the adults in herds, in which such cases are found, to be treated as if diseased, marked and segregated accordingly; all milk from such herds to be pasteurized, whether used for human food or for that of animals; the progeny to be effectively separated from the adults, regularly submitted to the tuberculin test and kept by themselves until the disease has been eliminated from the premises by the death or removal of the affected parent stock. Any animals added to the healthy herd would, of course, have to be tested on purchase, and retested after three months careful isolation.

I am free to admit that this plan is open to many of the objections which I have advanced against the other two already mentioned, but it appears to me to obviate the enormous economic waste and the tremendous popular opposition involved in the policy of compulsory slaughter, while it promises, if systematically applied and patiently and carefully carried out, infinitely better results than can be hoped for from that of promiscuously testing the herds of only such owners as are willing to submit them to the action of the authorities.

The presence of one or more actual clinical cases of tuberculosis in any herd would constitute a perfectly defensible and reasonable ground for official action, and



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by making notification by owners or veterinarians compulsory, as in other scheduled diseases, reliable information on which such action could be taken, would in most instances be forthcoming.

As has been well said by the editor of the *Lancet* in commenting on the recent able paper of Dr. Overland of Norway, the famous address of Dr. Koch in 1901 has, after all, by stimulating others to investigation and research, been productive of good, perhaps to an extent sufficient to offset the hesitation and delay in actual practical effort which it undoubtedly caused.

As a result of that address, we veterinarians to-day know, or perhaps I should say, have the proofs conclusive and satisfactory, of many things which we knew before, but were scarcely able to prove, regarding the transmissibility to man of bovine tuberculosis and vice versa.

And this brings me to vaccination, a subject on which I have nothing to say, beyond that, up to the present, the published results of inoculation with bovo-vaccine are, from a practical viewpoint, singularly confusing, inconclusive, and discouraging. The immunity acquired under the most favourable conditions appears to be of short duration, and any advantage which may be gained, is, to my thinking, more than offset by the danger of spreading the disease.

Where cultures of the human type are used the risks appear to be, if possible, even more serious. Weber and Tirze, working under the direction of the German Imperial Health Office, report, according to Theobald Smith, that the udder of a cow vaccinated with a human culture, shed human bacilli into the milk for a period of fifteen months.

Let us make haste slowly in work of this kind and be sure of our ground before we issue any more of those definite pronouncements which make nasty swallowing later on.

I have now briefly and inadequately placed before this Congress my views regarding the various methods recommended by scientists for the control of bovine tuberculosis. While these views may to some appear pessimistic, they are at least honest and have been carefully considered with due regard to the responsibility which the veterinary sanitarian, entrusted with large interests, owes to humanity at large as well as to those interests. Dogmatize as we may, we are still groping, and in this as in other matters of a like nature, those who have delved the deepest are the least sure of their ground.

In the meantime, while we are awaiting, as I fear we will for some time yet have to await, the discovery of a certain and satisfactory scientific method of dealing with bovine tuberculosis, let us, as practical men, carry on an energetic campaign of education among cattle owners and the general public. Bovine tuberculosis will be stamped out when individual owners realize that it pays much better to keep sound cattle than to lose money and feed in maintaining herds tainted with disease.

In this campaign of education there should first be taken up a question in regard to which veterinarians have hitherto, in most cases, been culpably negligent. If there is one matter to-day in which veterinarians are behind the age, it is that of failing to insist at all times, in season and out of season, on the importance to live stock of thorough and effective stable ventilation. Having before us the object lesson afforded by the medical profession, and the marvellous results which its members are achieving by open air treatment, not only helping, but actually curing advanced cases of tuberculosis, to say nothing of checking the disease, as is now daily done, in its early stages, it is nothing short of disgraceful that we are yearly permitting thousands of valuable animals to become infected owing to the unsanitary conditions under which their owners insist on keeping them.

Of the truth of this contention, which is, perhaps, at first sight, rather sweeping, there is no lack of proof. In northern countries where cattle are generally closely housed, and where a proper system of ventilation is the exception and not the rule.



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we almost invariably find bovine tuberculosis rampant. In milder climates where animals have free access to fresh air, as for instance among the Hereford cattle in England, it is a rare thing to find a case of that disease. On the ranges tuberculosis is unknown, except where it has been introduced by some pampered stable-bred individual, and even such a one is more likely to recover than to die, provided the malady is not too far advanced and the first winter can be endured.

To put the case plainly, stockmen are breeding tuberculosis a great deal faster through neglect of this important subject of ventilation than it will ever be possible to stamp it out by the promiscuous use of tuberculin and the slaughter of diseased animals.

I may be pardoned if, while on this subject, I refer briefly to an experiment which I have been carrying on for the last three years. A herd of forty-three (43) cattle, (twenty-one (21) being dairy cows) twenty-eight of which had reacted to tuberculin, the remaining fifteen being apparently free from disease, has been kept under open air conditions since the fall of 1905.

The objects of this experiment, which is of a purely practical nature, are three-fold; firstly, to ascertain the effect of open air treatment upon the diseased cattle themselves; secondly, to ascertain to what extent healthy cattle, kept in contact with diseased cattle under open air-conditions, are subject to infection; thirdly, to ascertain what percentage of healthy calves it is possible to rear from diseased cows, kept without any precautions under open air conditions.

The experiment is not yet concluded, nor have its results been properly tabulated for publication. I may say, however, that of the twenty-eight reactors, one only has broken down from generalized tuberculosis during the three years which have elapsed since the experiment began. One other has been killed owing to tuberculosis of the udder. Of the healthy animals kept in contact with them, feeding from the same racks, grazing over the same ground, drinking from the same pool, not a single one has become affected and this in spite of the fact that from time to time, animals suffering from acute generalized tuberculosis have been introduced to the herd and allowed to mix freely with its original members.

The results in the rearing of healthy calves, however, remind one somewhat of the Irishman's pigs, which, you will recollect, when killed, did not weigh as much as he expected and he never thought they would.

Of the calves dropped and reared by reacting cows, seventy-five per cent (75 per cent) have so far entirely failed to react, while twenty-five per cent (25 per cent) have reacted at various ages ranging from four months to one year. One calf died at six weeks old from generalized tuberculosis, this case being probably congenital.

The results of the various tests of the original reactors made at intervals of about six months and in the last case after a lapse of twelve months, are exceedingly interesting and will, when published, together with the *post mortem* notes, merit the careful perusal of those who believe in the absolute reliability of tuberculin as a diagnostic agent.

I might add that the cattle have had no shelter but open sheds and have, with the exception of a few of the weaker individuals, been fed nothing but hay for the three winters during which they have been under observation.

It should be mentioned that through an error in judgment on the part of an over-zealous herdsman, during the first winter, our calves began to arrive in December of 1906, the first being dropped when the thermometer was 29° below zero, the others following at intervals, sometimes very short, until the middle of March, 1907, and that in spite of this both dams and progeny thrive well in the open air.

The results are very interesting in view of the present tendency to consider the digestive tract the most frequent and certain channel of infection. While the experiment above outlined assists in proving that young animals can be and are most



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frequently infected through the digestive system, it also, to my mind, shows that, in the case of adults, infection through the air passages plays an important part.

I feel satisfied, and I think all practical men will agree, that had the healthy cattle in this experiment been kept under ordinary stable conditions with their diseased companions, they would not have escaped as they have done.

The highest medical authorities are nowadays advising, and with the very best possible results, our modern hothouse humanity, to get 'closer to nature' in every possible way. The advantages of adopting a similar policy in the handling and housing of domestic animals are too apparent to admit of discussion. Nature has furnished our animal friends with every conceivable requisite for protection against ordinary climatic conditions and most of the diseases and disabilities to which they are subject have been caused by and owe their continuance to the irrational artificial conditions imposed upon them by well-meaning but ignorant, or rather unthinking owners and attendants.

I am here, however, to learn and not to teach. The problem of the Control of Bovine Tuberculosis is undoubtedly the most serious confronting the veterinary sanitarian of to-day, and if the labours of this section of the International Congress result in its solution, I for one will be forever grateful.



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## APPENDIX No. 18.

## OPEN AIR EXPERIMENTS WITH TUBERCULOUS CATTLE.

OTTAWA, March 31, 1909.

To the Honourable,  
The Minister of Agriculture,  
Ottawa, Ont.

SIR,—In the year 1905 a herd of cattle on one of the outlying experimental farms situated in Nova Scotia were found, on being tested, to be badly affected with tuberculosis.

All clinical cases having been slaughtered, the survivors were at my request kept under open air conditions from December, 1905, until May, 1906, when they were removed to Ottawa and placed in a secluded pasture to which outside cattle had no access.

Here also they were kept under open air conditions, their only shelter being a frame shed one board thick, wind and weather proof above and on three sides, but on the fourth open to a large yard where they were fed in winter, but from which they were at liberty to wander at will. Except when undergoing test, they watered themselves at running streams on one of which a drinking place was always kept open in winter. The pasture, which consisted of some two hundred acres of rough land, abounded in natural shelter, the shed itself being situated in a grove of ever-green trees which afforded considerable protection from the keen winds of winter.

Their food consisted of grass in summer and in winter of good sound hay. A small grain ration was occasionally given for a short period to such of the older animals as appeared to require it, but these cases were very few, the majority keeping in good condition at all times, although naturally running down in flesh in the late summer and early fall, the seasons being through the whole experiment abnormally dry. Salt was kept constantly within reach.

On arrival at the station the herd numbered forty-three (43) head, twenty-eight (28) being pronounced reactors. Of these latter twenty-one (21) were females of dairy blood, comprising pure bred and grade Ayrshires, Holsteins and Guernseys ranging in age from one to eleven years. One was a pure bred Ayrshire bull two years old, and the other six (6) were yearling steers, one being a Hereford grade and the others grade Shorthorns.

Of the non-reacting animals two (2) were yearling heifers of Ayrshire blood, seven (7) were yearling Shorthorn grade steers, and five (5) were calves of various dairy breeds.

The objects which I had in view in commencing the experiment, which was of a purely practical character, were three in number:

(1) To ascertain the effects of the open air treatment on the diseased cattle themselves.

(2) To ascertain to what extent healthy cattle kept in contact with diseased cattle were subject to infection.

(3) To ascertain what percentage of healthy calves it is possible to rear without any precautions from diseased cows kept under open air conditions.

In the light of experience I am now convinced that in so far as the securing of definite information on these three points was concerned, this original herd should have been maintained intact and without additions throughout the whole course of the experiment.



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As will be shown, however, this was not done and the results of the work are accordingly less exact and proportionately less valuable from the breeder's point of view, although possibly more interesting to the professional man than they otherwise would have been.

The alterations which took place in the herd were as follows: One two-year-old heifer (non-reactor) and one bull calf died of black quarter shortly after arrival at the station. An eight-year-old cow (reactor) died of broncho-pneumonia after being mired in the creek for some time in freezing weather.

These losses as also some which occurred later among animals born on the station were, although regrettable, only such as might occur under any circumstances. I may say that after the occurrence of the black quarter cases, all the young stock was kept carefully vaccinated, and further, that no more cows got fast in the creek.

For the other changes, some of which I now think were mistakes, I must assume full responsibility.

In July, 1906, some few weeks after their arrival at the station the six reacting steers already mentioned were slaughtered under supervision. They were fat, and as we had numerous reactors capable of breeding and therefore more valuable, I grudged the grass they were eating, and decided to let them go.

Of the six reacting steers the carcass of one only was condemned, tubercular lesions being found in the post-pharyngeal glands and in the bronchial and mediastinal glands, as also a large abscess containing several pints of semi-fluid fetid pus involving the liver and the right kidney.

Although tuberculosis was found in each of the four others, it was of the slightest character. The sixth was apparently free from disease.

We may let them go from this paper as they went from the experiment, as their history is of little value, except in so far as it corroborates very strikingly the theory that the incipient case of tuberculosis gives the highest reaction to tuberculin. They were only long yearlings on arrival at the station, yet their highest temperatures, when tested the previous year in Nova Scotia were respectively,  $107.6^{\circ}$ ,  $106^{\circ}$ ,  $106^{\circ}$ ,  $108.2^{\circ}$ ,  $106^{\circ}$ ,  $105^{\circ}$ .

In the fall of 1907 the seven steers which were rated as healthy on arrival, having been subsequently tested several times without reaction, were slaughtered, no evidence of tubercular infection being discovered in any of these.

These steers should undoubtedly have been kept in contact with the diseased cattle until the close of the experiment, but as we had a number of other non-reactors, and these were of no value for breeding purposes, while the herd from natural increase and other additions numbered at this time over seventy-five (75) head, I was reluctantly compelled to let them go.

The outside animals added to the herd were of two kinds:

Owing to a lack of foresight on the part of those in charge of the cattle in Nova Scotia, during the latter part of the first winter the bull was permitted to run with the cows, most of which had not been bred during the previous season. As a natural result our calves began to arrive in November, most of them coming in December when the weather was intensely cold. Fearing that under open air conditions the loss would be considerable, I arranged for a supply of young calves from outside sources, and on such of the cows as were heavy milkers I put an extra calf. This also was an error from the point of view of exactitude in results, but although, as will be seen later, a greater percentage of these animals than of those born on the station, proved to be tubercular, I am not inclined to the belief that any of them were affected on arrival, as none of them were more than a few days old.

The other additions, however, comprised both diseased and healthy animals. Thirteen (13) mature reactors and one reacting yearling, mostly pure bred animals of the dairy breeds, were introduced from time to time, while four non-reacting yearlings were also added.



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Seven of these outside reactors were on arrival well marked clinical cases, and as several subsequently broke down with what was evidently a most virulent form of the disease I am inclined to think that they were responsible for the infection of the young stock and possibly for the re-infection of a number of the older animals which had ceased to react and were apparently on the road to recovery.

Their introduction was therefore another mistake, but as from several of them we were able to derive valuable information we need spend no time in vain regrets.

In all 350 tests were made during the course of the experiments, 259 of which were on reactors and the remainder on animals which with one exception, No. 4-A, to which special reference will be made later, were so far as it was possible to judge, free from tuberculosis.

Of the 350 tests above mentioned, 161 were made in such a way as to ensure the detection of any abnormally early reaction, and it is interesting to note that although in 119 of these cases the animals tested were reactors and in twenty-one (21) the period between the tests was less than three months, there were only seven (7) instances in which it might have been possible to miss the highest reading by beginning to take post injection temperatures at the tenth hour as was the usual practice until the announcement made by Professor Vallée, a few years ago, led us to look for earlier reactions, especially in animals which had been previously tested within a short period.

As it is rather interesting, I will give the details of these cases as follows:

No.	Name.	No. of test.	Period since last test.	Date of test.	Distinct rise.	Highest temp.	Normal temp.
4	Sarah	7th	11 mos.	Sept. 1908	2d hr.	8th hr.	10th hr.
6	Mamie	4th	8 mos.	May 1907	4th hr.	4th hr.	7th hr.
13	Polly	8th	3 mos.	Feb. 1909	6th hr.	8th hr.	20th hr.
15b	Lydia's calf (adopted)	2d	11 mos.	Sept. 1908	2d hr.	2d. hr.	8th hr.
18a	Bonnie Lass's heifer calf	2d	3½ mos.	Nov. 1907	4th hr.	8th hr.	10th hr.
30	Guernsey heifer	5th	11 mos.	Sept. 1908	4th hr.	8th hr.	16th hr.
68	Denty Girl	4th	11 mos.	Sept. 1908	2d. hr.	8th hr.	10th hr.
86a	Illuminata 3d's calf	3d	3 mos.	Feb. 1909	2d. hr.	24th hr.	26th hr.

It is noteworthy that none of these early reactions occurred in the twenty-one (21) cases in which the last previous test had been made less than three months before, and that, in fact, most of them occurred in animals which had not been tested for nearly a year.

The eighth test in this table (86a, Illuminata 3d's calf) is only listed with the others as showing one of the eccentricities of temperature which may be encountered when using tuberculin.

Having now laid before you a general outline of the experiment, I propose to run as rapidly as possible over its details, first dealing with each animal separately and concluding with a brief summary of the results obtained.

The information to be derived from these is perhaps of minor value, being decidedly negative in character, but as we have reason to know, it is not well to be at any time too positive in regard to bovine tuberculosis.

In order to economize your time and patience, I propose on this occasion to give only the results of each test and not the various temperatures. The tests were of various kinds. Those of May and October, 1905, September, 1906, July and October, 1907, and February 18, 1909, were conducted in the ordinary way by injecting at night and commencing to take temperatures at or about the tenth hour thereafter.

On the other hand, in that of May, 1907, the taking of temperature was begun at the fourth hour after injection and continued every third hour until the seven-



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teenth hour, while in those of September and November, 1908, the first temperature was taken two hours after injection, subsequent temperatures being taken every second hour until the twenty-fourth hour.

That of February 21 to 27, 1909, was a special test in which only a few of the survivors were dealt with. In this test a large number of preliminary temperatures were taken, the animals injected at 3.30 p.m. on the 25th and temperatures taken at the third hour and continued for over twenty-four hours.

In the cases of some of the added cattle, dates other than those just mentioned will be noticed. These tests which were not made at the station were all of the usual nature.

Koch's tuberculin was used, and while the doses were graded to suit the different ages of the animals, they were never any larger than would have been administered in an ordinary official test. It was unfortunate that the animals had to be tied up when being tested, as this was an interference with their usual habit of life, but every precaution was taken to prevent their becoming annoyed or excited, and I do not think that in any one case the results of the test were affected from this cause.

At the conclusion of the experiment all the animals then alive, except those which had been clearly shown to be healthy by repeated tests and isolated accordingly, were killed. Most of them were buried on the premises, but those whose condition warranted such a course, were slaughtered under careful inspection for use as food.

#### ORIGINAL HERD.

The age given is that of the animal at the time of slaughter or at the close of the experiment.

No. 1. *Maggie*.—Grade Ayrshire cow, 7 years.

Never showed clinical evidence of tuberculosis.

Ceased reactor.

Reacted May, 1905; October, 1905; September, 1906; May, 1907.

Tested without reaction October, 1907; September, 1908.

Slaughtered October 20, 1908.

Autopsy.—Small tubercular nodule left lung; caseated purulent lesions, posterior mediastinal glands.

Progeny.—(1a) Bull calf born February, 1907, always healthy and thrifty.

Tested without reaction October, 1907, September, 1908.

Slaughtered December 21, 1908.

Autopsy.—No evidence of tuberculosis.

No. 2. *Winnie*.—Grade Guernsey cow, 7 years.

Never showed clinical evidence of tuberculosis.

Reacted May, 1905; October, 1905.

Tested without reaction, September, 1906; May, 1907; October, 1907.

Reacted September, 1908; November, 1908.

Slaughtered November 19, 1908.

Autopsy.—Tubercular lesions both lung, some encysted, others recent; purulent tubercular nodules size pigeon's egg in peritoneum; small encysted and calcified lesions in posterior mediastinal and mesenteric glands.

Progeny—

Bull calf, born January, 1907 (cryptorchid).

Not tested.

Slaughtered June, 1907.

Autopsy.—No evidence of tuberculosis.

(2a) Bull calf born April, 1908; always healthy and thrifty.

Tested without reaction September, 1908; February, 1909.

Slaughtered April 26, 1909.

Autopsy.—No evidence of tuberculosis.



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No. 3. *Yellow Kate*.—Imported pure bred Ayrshire cow, 9 years.

Animal lost flesh rapidly winter of 1906-7, when she nursed two calves; afterwards improved, but never again became fat, although showing no clinical evidence of tuberculosis.

Reacted May, 1905; October, 1905; September, 1906.

Tested without reaction May, 1907; October, 1907.

Reacted September, 1908.

Slaughtered October 18, 1908.

Autopsy.—Tubercular lesions left lung; some purulent, others encysted; calcified lesions anterior and posterior mediastinal glands; many small calcareous encysted nodules in mesenteric glands.

Progeny—

(3a) Heifer calf born December, 1906, healthy and thrifty.

Tested without reaction July, 1907; September, 1908; February, 1909.

Has since remained healthy.

(3b) Bull calf adopted December, 1906.

Healthy and thrifty.

Tested without reaction October, 1907.

Reacted September, 1908; November, 1908; February, 1909.

Slaughtered March 6, 1909.

Autopsy.—Left post pharyngeal gland tubercular, caseous. No other lesions.

(3c) Bull calf adopted December, 1906.

Died October, 1907, of diarrhœa.

Autopsy.—Very small tubercular lesions in one post pharyngeal gland.

(3d) Bull calf born May, 1908, healthy and thrifty.

Reacted September, 1908.

Slaughtered October 21, 1908.

Autopsy.—Tubercular lesions posterior mediastinal glands.

No. 4. *Sarah*.—Pure bred Ayrshire cow 8 years.

Never showed clinical evidence of tuberculosis.

Reacted May, 1905.

Tested without reaction October, 1905; September, 1906; May, 1907.

Doubtful reaction July, 1907; October, 1907.

Reacted September, 1908.

Tested without reaction November, 1908.

Slaughtered November 19, 1908.

Autopsy.—No evidence of tuberculosis.

Progeny—

(4a) Heifer calf born December, 1906, healthy and thrifty, no evidence of tuberculosis.

Tested without reaction July, 1907; May, 1908; November, 1908; February, 1909.

(See note.)

Slaughtered February 19, 1909.

Autopsy.—Right lung contained six purulent cavities, each as large as an egg; tubercular process involving visceral, diaphragmatic and costal pleural surfaces, right side of thorax; anterior and posterior mediastinal glands also tubercular.

No. 5. *Norah*.—Pure bred Ayrshire cow, 6 years.

Never showed clinical symptoms of tuberculosis.

Ceased reactor.

Reacted May, 1905; October, 1905.

Tested without reaction September, 1906; May, 1907; October, 1907; September, 1908; November, 1908.



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Slaughtered November 19, 1908.

Autopsy.—No lesions of tuberculosis detected.

Progeny—

(5a) Bull calf at foot on arrival at station, always healthy and thrifty.

Tested without reaction September, 1906.

Has since remained healthy.

(5b) Bull calf born January, 1907, healthy and thrifty.

Tested without reaction July, 1907; May, 1908; November, 1908.

Slaughtered December 21, 1908.

Autopsy.—No evidence of tuberculosis detected.

(5c) Bull calf born April, 1908, healthy and thrifty.

Tested without reaction September, 1908; February, 1909.

Has since remained healthy.

No. 6. *Mamie*.—Pure bred Ayrshire cow, 5 years.

Never showed clinical evidence of tuberculosis.

Reacted May, 1905; October, 1905; September, 1906; May, 1907.

Tested without reaction October, 1907.

Reacted September, 1908.

Slaughtered October 18, 1908.

Autopsy.—Small encysted tubercular nodules anterior and posterior mediastinal glands. Caseous and encysted nodules in cervical lymphatic glands.

Progeny—

(6a) Heifer calf (twin) born December, 1906, always healthy and thrifty.

Tested without reaction July, 1907; November, 1907; May, 1908; November, 1908; February, 1909.

Slaughtered April 26, 1909.

Autopsy.—No evidence of tuberculosis.

(6b) Bull calf (twin) born December, 1906, healthy and thrifty.

Tested without reaction July, 1907; November, 1907; May, 1908.

Slaughtered December 21, 1908.

Autopsy.—No evidence of tuberculosis.

(6c) Heifer calf born April, 1908, healthy and thrifty.

Reacted September, 1908.

Slaughtered October 21, 1908.

Autopsy.—No evidence of tuberculosis.

No. 7. *Beatrice*.—Pure bred Ayrshire cow, 8 years.

Showed no clinical evidence of tuberculosis

Reacted October, 1905; September, 1906.

Died January, 1907, from broncho-pneumonia, contracted through being mired in creek.

Autopsy.—Small encysted tubercular lesions in peri-bronchial, anterior and posterior mediastinal glands.

Progeny—

(7a) Heifer calf born December, 1906, healthy and thrifty.

Tested without reaction July, 1907; November, 1907; May, 1908; November, 1908.

Has since remained healthy.

No. 8. *Minnie*.—Pure bred Ayrshire cow, 5 years.

Never showed clinical evidence of tuberculosis

Ceased reactor.

Reacted May, 1905; October, 1905.



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Tested without reaction September, 1906; May, 1907; October, 1907; September, 1908.

Slaughtered October 20, 1908.

Autopsy.—Slight encysted lesion in left lung. Encysted lesions in mesenteric gland.

## Progeny—

(8a) Heifer calf born November, 1906, healthy and thrifty.

Tested without reaction July, 1907.

Doubtful reaction November, 1907.

Reacted September, 1908.

Doubtful reaction November, 1908; February, 1909.

Slaughtered March 6, 1909.

Autopsy.—Traces of previous peritonitis; no positive evidence of tuberculosis found in spite of careful examination.

(8b) Bull calf adopted November, 1906, healthy and thrifty.

Tested without reaction October, 1907; September, 1908.

Has since remained healthy.

(8c) Bull calf, born June, 1908.

Died from navel infection June 30, 1908.

Autopsy.—No evidence of tuberculosis.

No. 9. *Sonsy*.—Pure bred Ayrshire cow, 12½ years.

Tuberculosis of the udder detected on arrival at station. The following year showed clinical symptoms.

## Clinical—

Reacted May, 1905; October, 1905; September, 1906.

Tested without reaction May, 1907.

Doubtful reaction July, 1907.

Slaughtered September 27, 1907.

Autopsy.—Generalized tuberculosis, pharyngeal glands caseated, left hind quarter udder caseated, also entire mesenteric chain, bronchial and mediastinal glands and pericardium affected. Tubercular deposit on pleural surfaces, both lungs adherent to costal pleura; portal glands affected, tubercular deposit on peritoneum, liver and one kidney.

## Progeny—

(9a) Heifer calf born 1905; arrived at station at foot, healthy and thrifty.

Tested without reaction September, 1906; December, 1906; May, 1908.

Has since remained healthy.

(9b) Bull calf born February, 1907. Did not thrive, and although apparently healthy at birth and for some time afterwards, failed to develop and was noticed to cough occasionally—remained thin.

Tested without reaction July, 1907.

Reacted October, 1907.

Slaughtered October 10, 1907.

Autopsy.—Few nodules on lung surfaces, mediastinal and bronchial glands slightly affected.

No. 10. *Guernsey Heifer*.—4½ years.

While showing no definite symptoms, remained thin and unthrifty.

Gave birth to two calves, one premature and one stillborn.

Reacted October, 1905; September, 1906; May, 1907; October, 1907; September, 1908.

Slaughtered October 18, 1908.

Autopsy.—Open tubercular lesions, caseated and purulent in lungs; similar lesions in liver; intestinal ulceration, grape formation on costal pleura,



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nodules on diaphragm and spleen; lymph glands encysted; purulent lesions in post pharyngeal; purulent and encysted lesions in peribronchial, purulent broken down lesions in anterior and posterior mediastinal; encysted lesions in the periportal glands. Caseous lesions generally distributed throughout the mesenteric glands and encysted lesions in the trunk lymphatic glands.

Progeny—

(10a) Bull calf adopted January, 1907, healthy and thrifty.

Tested without reaction October, 1907; September, 1908.

Slaughtered December 21, 1908.

Autopsy.—No evidence of tuberculosis.

No. 11. *Grade Ayrshire Heifer 'A.'*—4 years.

Exhibited clinical symptoms almost immediately after arrival at station, which continued to develop, although occasional temporary improvement was noticeable. Finally became greatly emaciated. Before slaughter she exhibited distressed breathing, was hide bound and suffered from diarrhœa. Gave birth to premature calf soon after arrival and reared one adopted one. She was also the dam of another (No. 22), which arrived at station when 6 months old. As will be noted, the adopted calf was tested three times, reacting to the two last tests.

Clinical

Reacted October, 1905; September, 1906.

Tested without reaction May, 1907.

Slaughtered June 10, 1907.

Autopsy.—Generalized tuberculosis. Extensive lesions in lungs, breaking down, pus escaping from bronchial tubes. Tubercular deposits in retropharyngeal, anterior, posterior bronchial and mesenteric also sub-lumbar lymphatic glands.

Progeny (See No. 22)—

(11a) Bull calf adopted September, 1906. No clinical symptoms, but unthrifty.

Tested without reaction May, 1907.

Reacted October, 1907; September, 1908.

Slaughtered October 20, 1908.

Autopsy.—Caseated and calcified tubercular lesions right lung; encysted and calcified lesions in peribronchial and in anterior mediastinal glands

No. 12. *Ayrshire Heifer 'B'*—

Never showed clinical evidence of tuberculosis.

Reacted October, 1905; September, 1906.

Tested without reaction, May, 1907.

Doubtful reaction October, 1907.

Reacted September, 1908; November, 1908; February, 1909.

Slaughtered March 6, 1909.

Autopsy.—Tubercular lesions at base of each lung; tissue involved in both being size of man's fist, and having direct connection with bronchi. Small lesions in anterior and posterior mediastinal glands.

Progeny—

(12a) Bull calf arrived at station at foot, healthy and thrifty.

Tested without reaction September, 1906; December, 1906; May, 1907

Has since remained healthy.

(12b) Bull calf arrived at station at foot, healthy and thrifty.

Tested without reaction September, 1908.

Reacted February, 1909.



## SESSIONAL PAPER No. 15b

Slaughtered February 19, 1909.

Autopsy.—Small calcified tubercular lesions in right posterior pharyngeal lymphatic gland; posterior mediastinal glands hemorrhagic; no other lesions.

No. 13. *Polly*.—Grade cow, 5 years.

Never showed evidence of tuberculosis.

Reacted May, 1905; October, 1905; September, 1906.

Tested without reaction May, 1907; October, 1907.

Reacted September, 1908; November, 1908; February, 1909.

Slaughtered March 6, 1909.

Autopsy.—Tubercular lesions on pleura, taking form chronic tubercular pleurisy. Some sub-pleura tubercular nodules. No other lesions.

Progeny—

(13a) Bull calf born December, 1906, healthy and thrifty.

Tested without reaction October, 1907; September, 1908.

Slaughtered December 21, 1908.

Autopsy.—No evidence of tuberculosis.

(13b) Bull calf adopted December, 1906, healthy and thrifty.

Tested without reaction October, 1907; September, 1908.

Slaughtered December 21, 1908.

Autopsy.—No evidence of tuberculosis.

(13c) Heifer calf born May, 1908, appeared healthy and thrifty.

Reacted September, 1908; February, 1909.

Slaughtered February 19, 1909.

Autopsy.—Very small calcified tubercular lesions in posterior mediastinal glands. No other evidence of tuberculosis.

No. 14. *Jessie*.—Grade Ayrshire, 5 years.

No clinical evidence of tuberculosis.

Ceased reactor.

Reacted May, 1905; October, 1905.

Tested without reaction September, 1906; May, 1907; October, 1907; September, 1908; November, 1908.

Slaughtered November 19, 1908.

Autopsy.—Small purulent nodules (tubercular) partially encysted inferior lobe left lung, also small nodule in posterior mediastinal glands.

Progeny—

(14a) Heifer calf born January, 1907; healthy and thrifty.

Tested without reaction October, 1907; September, 1908; February, 1909.

Has since remained healthy.

(14b) Heifer calf born May, 1908, healthy and thrifty.

Tested without reaction September, 1908; February, 1909.

Has since remained healthy.

No. 15. *Lydia Rooker*.—Pure bred Holstein cow, 7 years.

Showed no symptoms of disease although for some time suspected of udder tuberculosis. Owing to this suspicion her milk was repeatedly subjected to microscopical examination, without result, so far as the detection of tubercule bacilli was concerned.

Reacted May, 1905; October, 1905.

Tested without reaction September, 1906; May, 1907; October, 1907; September, 1908; November, 1908.

Reacted February, 1909.

Slaughtered March 6, 1909.

Autopsy.—No evidence of tubercular infection.



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## Progeny—

(15a) Heifer calf born January, 1907, healthy and thrifty.

Tested without reaction October, 1907.

Doubtful reaction September, 1908.

Reacted February, 1909.

Slaughtered February 19, 1909.

Autopsy.—No evidence of tuberculosis.

(15b) Steer calf adopted January, 1907. Did not thrive very well, but remained apparently healthy.

Doubtful reaction October, 1907; September, 1908.

Tested without reaction November, 1908; February, 1909.

Slaughtered March 6, 1909.

Autopsy.—Calcified tubercular lesions in posterior mediastinal glands.

No. 16. *Rex's Maud*.—Pure bred Guernsey cow, 13 years.

Showed no symptoms of disease save an occasional cough. At times run down in condition, but not more than might reasonably be expected in an aged animal kept previously under artificial conditions.

## Clinical—

Reacted May, 1905; October, 1905.

Tested without reaction September, 1906; May, 1907; October, 1907.

Doubtful reaction September, 1908.

Slaughtered October 18, 1908.

Autopsy.—Tubercular lesions at base of both lungs; in the right caseous and purulent; in the left purulent, opening direct into a bronchial tube through which pus was escaping. This pus proved infective to a guinea pig, proving the animal to have been a source of danger to others. Adhesions present on the costal pleuræ; caseated and encysted nodules in anterior and posterior mediastinal glands. Caseous and encysted nodules in periportal glands; numerous calcareous encysted nodules in the mesenteric glands and caseated nodules in the thoracic trunk glands.

## Progeny—

(16a) Heifer calf born February, 1907, healthy and thrifty.

Tested without reaction October, 1907.

Reacted September, 1908.

Slaughtered October 20, 1908.

Autopsy.—Small tubercular lesions along posterior border left lung; few tubercular nodules in the anterior mediastinal gland.

(16b) Bull calf born May, 1908, healthy and thrifty.

Tested without reaction September, 1908; February, 1909

Has since remained healthy.

No. 17. *Curly*.—Grade Guernsey cow, 7 years.

Always in excellent condition; never showed any evidence of tuberculosis.

Reacted October, 1905; September, 1906.

Doubtful reaction May, 1907.

Slaughtered June 20, 1907.

Autopsy.—Generalized tuberculosis, both lungs full of tubercular lesions; extensive adhesions both sides of thoracic cavity; tubercular lesions in the retropharyngeal, prepectoral, anterior and posterior mediastinal, bronchial mesenteric and inguinal glands; stenosis of the os-uteri

Progeny.—None.



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No. 18.—*Bonny Lass*.—Pure bred Ayrshire cow, 4 years.

Showed no symptoms of disease; always in good condition  
Reacted October, 1905; September, 1906.

Tested without reaction May, 1907; October, 1907

Reacted September, 1908.

Tested without reaction November, 1908

Slaughtered November 19, 1908.

Autopsy.—Extensive caseous and purulent lesions in both lungs with direct communication to the bronchial tubes; caseous and encysted lesions in the peribronchial anterior and posterior mediastinal, and encysted and calcified lesions in mesenteric glands.

Progeny—

(18a) Heifer calf born November, 1906, healthy and thrifty.

Tested without reaction July, 1907.

Reacted November, 1907; September, 1908.

Slaughtered November 13, 1908.

Autopsy.—Limited number of solitary tubercles about size of millet seed in apex of right lung. Tuberculous nature of these confirmed by microscopic examination; inflammatory changes in posterior mediastinal glands, but no definite tubercle formation. These changes were shown to be tubercular by microscopic examination.

(18b) Heifer calf born April, 1908, healthy and thrifty.

Tested without reaction September, 1908; February, 1909.

Has since remained healthy.

No. 19. *Holstein Heifer 'B.'*—4 years.

Kept in good condition; showed no evidences of tuberculosis.

Ceased reactor.

Reacted May, 1905; October, 1905; September, 1906.

Tested without reaction May, 1907; October, 1907; September, 1908.

Slaughtered October 22, 1908.

Autopsy.—Areas of tubercular infection on omentum; calcified lesions in peribronchial anterior and posterior mediastinal glands; small tubercular area, anterior portion left lung. Open.

Progeny—

(19a) Bull calf born November, 1906, healthy and thrifty.

Tested without reaction October, 1907; September, 1908.

Slaughtered December 21, 1908.

Autopsy.—No evidence of tubercular infection.

No. 20. *Holstein Cow 'A.'*—4½ years.

Always in good condition; never showed clinical evidence of tuberculosis.

Reacted May, 1905; October, 1905.

Tested without reaction September, 1906.

Reacted May, 1907; September, 1908.

Slaughtered October 21, 1908.

Autopsy.—Tubercular lesions in peribronchial and posterior mediastinal glands; caseous, some undergoing calcification.

Progeny—

(20a) Heifer calf, born December, 1906, healthy and thrifty.

Tested without reaction October, 1907; September, 1908; February, 1909.

Has since remained healthy.



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No. 22. *Ayrshire Grade Heifer*, calf of No. 11.—3½ years.

Never showed clinical evidence of tuberculosis.

Tested without reaction September, 1906; May, 1907; October, 1907; September, 1908.

Reacted February, 1909.

Slaughtered February 19, 1909.

Autopsy.—Tubercular lesions evidently of recent origin found on posterior mediastinal and peribronchial glands.

Gave birth to two calves, both of which died at birth or immediately after. In these a careful post-mortem examination failed to reveal evidence of tuberculosis.

No. 28. *Togo*.—Pure bred Ayrshire bull, 4½ years.

Developed well, remained thrifty, no clinical evidences of tuberculosis.

Reacted October, 1905; September, 1906; May, 1907; October, 1907; September, 1908.

Slaughtered October 21, 1908.

Autopsy.—Calcified tubercular lesions in anterior and posterior mediastinal glands. No other lesions detected.

No. 29. *Holstein Cow*.—4 years.

Never showed clinical evidences of tuberculosis.

Reacted May, 1905.

Tested without reaction October, 1905 (high preliminary temp.); September, 1906; May, 1907; October, 1907.

Reacted September, 1908.

Slaughtered October 22, 1908.

Autopsy.—Small ulcerated area and small nodule on omentum. Also small nodule on liver. Microscopical examination of these lesions failed to reveal presence of tuberculosis.

Progeny—

(29a) Heifer calf born April, 1907, healthy and thrifty.

Tested without reaction October, 1907.

Doubtful reaction September, 1908.

Slaughtered November 13, 1908.

Autopsy.—No evidence of tuberculosis detected.

No. 30. *Guernsey Grade Cow*.—4 years.

Condition of this animal varied considerably; showed no clinical symptoms of tuberculosis, but was never fat.

Reacted October, 1905.

Tested without reaction September, 1906.

Reacted May, 1907; October, 1907; September, 1908.

Slaughtered October 18, 1908.

Autopsy.—Tubercular lesions present in liver appearing as small excrescences of an active type on its external surface while the body of the organ contained a tubercular mass 5 inches in diameter. Excrescences on peritoneum, nodules in lymph glands; encysted lesions in posterior mediastinal and periportal glands; encysted and purulent lesions in some of the mesenteric and encysted lesions in the abdominal trunk glands.

Progeny—

(30a) Heifer calf, born January, 1907. Remained apparently healthy until February 13, 1907, when it was attacked with diarrhœa, which however, yielded to treatment in about eight days. Few days later became dull.



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elevated temperature, cough at intervals. Cough gradually became more frequent, respirations more rapid; nasal discharge. Gradually became worse and died March 11, 1907.

Autopsy.—Tubercular lesions right lung; also in thymus gland which was full of miliary tubercles; few tubercles also in parenchyma of spleen.

(30b) Heifer calf born April, 1908, healthy and thrifty.

Tested without reaction September, 1908; February, 1909.

Has since remained healthy.

No. 31. *Ayrshire Cow*.—4 years.

Never showed clinical evidence of tuberculosis.

Tested without reaction October, 1905; September, 1906; May, 1907; October, 1907; September, 1908; February, 1909.

Has since remained healthy.

Progeny—

(31a). Bull calf born June, 1908, healthy and thrifty.

Tested without reaction September, 1908; February, 1909.

Has since remained healthy.

This disposes of the original herd. The following animals are those which, as has already been stated, were introduced to the herd from time to time during the course of the experiment.

No. 45. *Bloomer*.—Pure bred Ayrshire cow.

Arrived station June, 1906; never showed clinical evidences of tuberculosis.

Reacted November, 1905.

Doubtful reaction December, 1905.

Tested without reaction April, 1906; September, 1906; May, 1907.

Reacted October, 1907; September, 1908.

Slaughtered November, 1908.

Autopsy.—Tubercular lesions left lung, with area undergoing caseation, with communication to bronchial tubes. Caseating lesions anterior and posterior mediastinal, mesenteric and lymphatic glands.

Progeny—

(45a) Heifer calf born June, 1907, healthy and thrifty.

Reacted September, 1908.

Slaughtered October 20, 1908.

Autopsy.—Purulent lesion left post-pharyngeal gland. No other lesions detected.

No. 46. *Maggie II*.—Pure bred Ayrshire cow.

Arrived station June, 1906; in poor condition, wild, excitable and vicious. Later became quiet and improved in condition.

Reacted November, 1905.

Tested without reaction December, 1905; April, 1906; September, 1906; May, 1907; October, 1907.

Reacted September, 1908.

Slaughtered October 21, 1908.

Autopsy.—Tubercular lesions base of right lung; caseating, purulent, encysted; apparently an open case.

Progeny—

(46a) Heifer calf born April, 1907, healthy and thrifty.

Tested without reaction September, 1908; February, 1909.

Has since remained healthy.



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No. 65. *Canada Regens*.—Pure bred French Canadian cow.—4½ years.

Arrived at station December, 1906; apparently healthy except for persistent cough.

Reacted September, 1906.

Doubtful reaction May, 1907.

Reacted October, 1907.

Reacted September, 1908.

Slaughtered October 21, 1908.

Autopsy.—Tubercular lesions in mesenteric glands. One lesion size of ostrich egg, involving a single gland and causing obliteration of the entire glandular structure. External portion of this mass was calcified; in the center a cavity about the size of a hen's egg containing a serous exudate. No other lesions.

No. 66. *Legacy*.—Pure Ayrshire cow, 5 years.

Animal arrived at station December, 1906, in fair condition, but never laid on flesh.

Reacted December, 1906.

Tested without reaction May, 1907; October, 1907

Reacted September, 1908.

Slaughtered October 18, 1908.

Autopsy.—Limited encysted tubercular lesions right lung. Caseated nodules in anterior mediastinal, posterior mediastinal and peribronchial glands; encysted nodules in peribronchial and few caseated nodules in mesenteric glands.

Progeny.—

(66a) Heifer calf, adopted December, 1907, healthy and thrifty.

Reacted October, 1907; September, 1908.

Tested without reaction November, 1908; February, 1909.

Slaughtered March 7, 1909.

Autopsy.—Caseated and calcified tubercular lesions in anterior mediastinal glands. No other indications of tuberculosis detected.

(66b) Bull calf born April, 1908, healthy and thrifty.

Tested without reaction, September, 1908.

Slaughtered October 22, 1908.

Autopsy.—No evidence of tubercular infection.

No. 67. *Maggie III*.—Pure bred Ayrshire cow, 3 years.

Arrived at station December, 1906. Unthrifty but no clinical evidence of tuberculosis.

Ceased Reactor.

Reacted December, 1906.

Tested without reaction May, 1907; October, 1907; September, 1908; November, 1908.

Slaughtered November 19, 1908.

Autopsy.—No evidence of tuberculosis detected.

Progeny.—

(67a) Bull calf born June, 1908.

Tested without reaction September, 1908; February, 1909

Has since remained healthy.

No. 68. *Denty Girl*.—Pure Bred Ayrshire cow 5 years.

Arrived at station December, 1906, in fair condition, but with persistent cough.

Reacted December, 1906.



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Tested without reaction May, 1907; October, 1907

Reacted September, 1908.

Slaughtered October 18, 1908.

Autopsy.—No lesions of tuberculosis found in thoracic or abdominal cavities. Left popliteal gland caseated and purulent. Tubercular bacilli with. Left popliteal gland caseated and purulent. Tubercular bacilli with.

Progeny. —

(68a) Heifer calf adopted, (transferred from Beatrice No. 7, January, 1907, on the death of that animal), healthy and thrifty.

Reacted October, 1907; September, 1908.

Tested without reaction November, 1908.

Reacted February, 1909.

Slaughtered March 6, 1909.

Autopsy.—Caseous tubercular lesions post pharyngeal glands. Caseous and calcified lesions in periportal gland. Calcified lesions in posterior mediastinal gland and in peribronchial glands.

(68b) Heifer calf born January, 1907, healthy and thrifty.

Tested without reaction July, 1907; November, 1907.

Has since remained healthy.

(68c) Bull calf born April, 1908, healthy and thrifty

Reacted September, 1908; February, 1909

Slaughtered February 19, 1909.

Autopsy.—One calcified tubercular nodule size of pigeon's egg, right posterior mediastinal gland.

No. 78. *Jersey Grade Cow*.—8 years.

Arrived at station January, 1907, in fair condition, but with persistent cough. Gradually lost flesh, cough becoming more troublesome, accompanied by nasal discharge.

Reacted May, 1907; October, 1907

Died July 31, 1908.

Autopsy.—Inflammatory peritoneal adhesions; kidneys enlarged and congested with hemorrhages in the parenchymatous portions; abdominal lymphatic glands, including mesenteric and periportal, involved in tubercular lesions, which were of two kinds; some wholly encysted and walled off from remaining glandular tissue; others recently formed, scarcely visible to the naked eye, with hemorrhages, apparently resulting from tuberculous septicemia. Fallopian tubes presented very advanced tubercular condition, the giant cells having been destroyed and each field of the microscope showing a mass of tubercle bacilli.

Progeny—

(78a) Bull calf born July, 1907, healthy and thrifty.

Reacted September, 1908; November, 1908; February, 1909.

Slaughtered March 6, 1909.

Autopsy.—Left postpharyngeal gland purulent and calcified.

No. 82. *Count Cedric*.—Pure bred Shorthorn bull, 2½ years.

Arrived at station July 4, 1907. Condition varied considerably; during fall of 1907 became emaciated, refused food; persistent high temperature; later improved, but never regained perfectly healthy appearance.

Reacted November, 1906; May, 1907; October, 1907; September, 1908.

Slaughtered October 22, 1908.



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Autopsy.—Tubercular lesions in postpharyngeal, anterior and middle cervical glands, which were completely broken down and contained in each instance large quantity purulent material. Caseated lesions in anterior mediastinal gland. Carcass greatly emaciated.

No. 84. *Flossie's Gem*.—Pure Guernsey cow, 4 years.

Arrived at station May, 1907; showed no clinical evidence of tuberculosis.

Reacted May, 1907.

Tested without reaction October, 1907.

Doubtful reaction September, 1908.

Slaughtered October 18, 1908.

Autopsy.—Slight pleuritic adhesions not definitely tubercular. Tubercular nodules omentum, purulent tubercular lesions in postpharyngeal glands.

Progeny—

(84a) Heifer calf born October, 1907, healthy and thrifty.

Reacted September, 1908.

Slaughtered October 31, 1908.

Autopsy.—No evidence of tubercular infection.

No. 85. *Ottawa Fortune*.—Pure bred French Canadian heifer, 3 years.

Arrived at station May, 1907; unthrifty, but on definite symptoms of

ing.

Reacted May, 1907.

Doubtful reaction October, 1907.

Slaughtered October 10, 1907.

Autopsy.—Tubercular lesions well marked, lungs badly affected, about one-quarter caseated, covered with nodules in grape formation. Much pleuritic adhesion; portal, mesenteric and lymphatic glands badly affected. Large nodules on liver.

No. 86. *Illuminata 3d*.—Pure bred Shorthorn heifer, 3 years.

Arrived at station May, 1907; unthrifty, but no definite symptoms of disease.

Reacted May, 1907; highest temperature 10 hours after injection, 107.6, with pronounced clinical disturbance.

(See note.)

Tested without reaction October, 1907.

Slaughtered November 25, 1907.

Autopsy.—No evidence of tubercular infection.

Progeny—

(86a) Bull calf born July, 1907; unthrifty but no clinical symptoms.

Doubtful reaction September, 1908.

Tested without reaction November, 1908.

Doubtful reaction February, 1909.

Slaughtered March 6, 1909.

Autopsy.—Slight pleuritic adhesion, which could not be considered as positive evidence of tuberculosis. Subsequent pathological investigation failed to give any confirmatory data.

No. 98. *Flora*.—Pure bred French Canadian cow, 5 years.

Arrived at station May, 1908. Never showed clinical evidence of tuberculosis.

Reacted May, 1908.

Doubtful reaction September, 1908; November, 1908.

Slaughtered November 19, 1908.



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Autopsy.—Few localized lesions (tubercular), evidently recent and active in both lungs. Purulent lesions large and small beneath peritoneum at border of omentum, near attachment to stomach. Twenty of these tubercular abscesses, each containing thick, creamy pus. No other lesions detected.

## Progeny—

(98a) Heifer calf born May, 1908, more or less unthrifty.

Reacted September, 1908; November, 1908; February, 1909.

Slaughtered March 6, 1909.

Autopsy.—No evidence of tubercular infection.

No. 99. *Grey Grade Steer*.—1 year.

Arrived at station May, 1908. No evidence of tuberculosis.

Tested without reaction May, 1908; September, 1908.

Slaughtered December 21, 1908.

Autopsy.—No evidence of tubercular infection.

No. 100. *Red Steer*.—1 year.

Arrived at station May, 1908. No evidence of tuberculosis.

Tested without reaction May, 1908; September, 1908.

Slaughtered December 21, 1908.

Autopsy.—No evidence of tubercular infection.

No. 101. *Guernsey Bull*.—Pure bred, 1 year.

Arrived at station September, 1908; showed no evidence of tuberculosis.

Reacted May, 1908; June, 1908.

Doubtful reaction August, 1908.

Reacted September, 1908.

Slaughtered October 31, 1908.

Autopsy.—Tubercular lesions undergoing caseation at base of both lungs; tubercular lesions in peribronchial glands.

No. 102. *Red Grade Heifer Calf*.

Arrived at station November, 1907, apparently healthy; no clinical evidence of tuberculosis.

Tested without reaction November, 1907; September, 1908.

Reacted February, 1909.

Slaughtered February 19, 1909.

Autopsy.—Tubercular lesions in anterior and posterior mediastinal glands; tubercular area about size of egg in right lung, containing caseated and calcified nodules, with direct discharge into bronchial tubes.

No. 103. *Jersey Cow*.—Pure bred, 5 years.

Arrived station September, 1907, in fair condition, but persistent cough.

Reacted October, 1907.

Slaughtered October 10, 1907.

Autopsy.—Tubercular lesions well marked; portions of lung tissue solidified.

Large areas caseated; numerous cavities containing pus; tuberculous nodules liver and pleura and in portal and mesenteric glands.

A reference to the list will show that cows Nos. 1, 5, 8, 14, 19 and 67 are classed as 'Ceased Reactors.' The post-mortem findings in these cases will be found especially interesting.

Three other cases (Nos. 9, 11 and 16) classed as 'Clinical,' also ceased to react, apparently owing to the disease having become generalized.

Eleven animals (Nos. 4, 5, 6c, 8a, 15, 15a, 29a, 67, 84a, 86 and 98a) reacted but failed on post-mortem examination to show any evidence of tuberculosis. Such cases



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are, as is well known, not at all uncommon. They furnish no argument against the reliability of tuberculin, but rather the opposite, occurring as they do in animals in which the disease is either of very recent origin or in which the lesions are so small or so deeply seated in unusual locations as to render their detection a matter of great difficulty. A striking instance of the last-mentioned condition is furnished by No. 68, in which the disease was confined to one popliteal gland.

The history of No. 86, although short, is very interesting and instructive. The pronounced reaction shown by this animal in May, 1907, would appear to indicate that the infection in her case was recent and very slight, while her subsequent record suggests the possibility of the progress of the disease having been at least temporarily arrested.

Of the two animals which died of tuberculosis, namely Nos. 30a and 78, one was a calf of two months in which the disease was probably congenital; the other, an aged Jersey cow, had reacted three times, the last test being ten months before death.

Special attention is directed to No. 4a, which, on being slaughtered on February 19, 1909, when over two years old, was found badly affected with tuberculosis, although it had never shown any evidence of disease and had been tested four times without reaction, the periods elapsing between the tests being ten, six and three months respectively.

This case is both interesting and instructive, showing as it does that an animal, while still retaining externally the appearance of health, may within a comparatively short period, become affected to such an extent as to nullify the action of tuberculin. Giving this heifer the benefit of the full period of incubation possible, as stated by our best authorities, namely, fifty days, the disease must, to all appearance, have been contracted not more than five months before the last test to which, as has been shown, there was no reaction.

Among the most noteworthy cases may be mentioned No. 17, an animal which was always fat, and which was expected to make excellent beef, but whose carcass was condemned for generalized tuberculosis. In view of the actual conditions revealed by the post-mortem, the doubtful reaction obtained from this animal a month before slaughter is particularly interesting.

The individual record of No. 22 is also instructive, especially when the history of her dam, No. 11, is taken into consideration.

The exceedingly well marked reactions given by No. 28, "Togo," at each time of testing are noteworthy, in view of the comparatively slight lesions found on post-mortem.

Perhaps the most striking feature of the whole experiment is the fact that sixteen mature animals (Nos. 2, 3, 4, 6, 12, 13, 15, 18, 20, 29, 30, 45, 46, 66, 68, 84) which positively reacted in from one to four tests became ceased reactors, but subsequently reacted again. In two of these animals the autopsy failed to reveal any evidence of tuberculosis, while in another the results were doubtful.

All the thirteen others were found to be diseased, although the degree of infection varied very greatly.

Special attention is directed to the post-mortem findings in No. 68. The diseased popliteal gland which was the only evidence of tuberculosis found would scarcely have been detected in the ordinary abattoir inspection and might easily have been missed in even a reasonably thorough post-mortem examination.

The fact that a number of these animals failed to react to the same test, and that their subsequent reactions also occurred simultaneously may suggest to some minds the possibility of these apparent eccentricities being due to a variation in the tuberculin used or to some peculiar condition affecting the test.

It must be remembered, however, that not only did several mature animals, among which may be specially mentioned Nos. 10, 28, 65 and 82, react regularly to the tests to which these others failed to respond, but that many other animals, as will be seen from their individual records, also reacted to one or more of these tests.



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Exclusive of those born dead, of which there were several, and those which died from causes other than tuberculosis, the number of calves entering into the experiment was fifty-two (52). Of these forty (40) belonged to the original herd, thirty-three (33) being progeny and seven (7) adopted, while of the remaining twelve (12) two (2) were adopted, and ten (10) the offspring of the cows subsequently introduced.

Of these, twenty-nine (29), comprising twenty-five (25) of the original herd, and four (4) from the added stock, escaped infection; twenty-one (21) contracted tuberculosis, and two (2) (Nos. 29a and 86a) were suspicious, having given doubtful reactions, but no evidence of disease on post-mortem examination.

No. 4a gave ample evidence of infection on post-mortem, without having at any time reacted, while Nos. 6c, 8a, 15a, 84a and 98a reacted positively, but gave no post-mortem proof of infection.

Giving one of the two (2) doubtfuls to each, gives us approximately 60 per cent of healthy calves as against 40 per cent. infected.

Of the calves born of the original herd, twenty-two (22) escaped infection, ten (10) became diseased, and one (1) remained doubtful, the proportion of healthy calves in this lot being therefore about 66 per cent, a showing somewhat worse than was anticipated, when in September, 1908, the experiment being then unfinished, I stated that twenty-five per cent (25 per cent) of the calves of these particular cows were likely to prove diseased.

Of the adopted calves three (3) only remained healthy, while six (6) proved to be infected, thus exactly reversing the percentage given above in the case of the calves born of the original herd.

Of the calves born of the cows brought to the station subsequent to the arrival of the original herd, four (4) only escaped infection, while five (5) became diseased, and one (1) was classed as doubtful. The percentage of diseased animals in this case was also much larger than in the original herd, a result which is not surprising, when the large number of advanced clinical cases of tuberculosis among the dams is taken into account.

Of the calves, seventeen (17) in all, which remained healthy and alive at the close of the experiment, three (3) were born in 1905; five (5) in 1906; three (3) in 1907 and six (6) in 1908.

Of the thirteen (13) which failed to react, and were found healthy on slaughter, six (6) were over two years old, five (5) were over one year, and two (2) were six months old.

Summarizing the results of the experiment, on the lines laid down at its inception, it will be seen that, even under the limitations attributable to the removals and additions which were unfortunately permitted, these results are not entirely valueless.

So far as the effects of open air treatment on the animals themselves is concerned, it may be noted that among the members of the original herd, five (5), namely, Nos. 1, 5, 8, 14 and 19, ceased to react; that in one of these, Nos. 5, the post-mortem examination revealed no evidence of disease, while in No. 8 the slight lesions found were all encysted. The conditions in Nos. 1 and 14 were less satisfactory, while that of No. 19 was decidedly discouraging.

Among the added cows will be found another, No. 67, which, entering the herd in December, 1906, also became a ceased reactor, and in her case the autopsy failed to reveal the existence of disease.

As has already been stated, eleven (11) cows of the original herd and five (5) of those added later also became ceased reactors, but afterwards began again to react. The fact that in three of these, Nos. 4, 15, and 29, no satisfactory evidence of tuberculosis was found on post-mortem, suggests a recent reinfection. Whether or not the recrudescence of the disease which had apparently taken place in all the others of this lot, was due, as I have already suggested, to reinfection from the very virulent clinical cases introduced from outside, can only remain a matter of conjecture.

During the three years that the experiment was in progress, only one animal of



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the original herd, namely No. 11, actually broke down. This case showed clinical symptoms almost immediately after arrival and only lived a little over a year. She might, therefore, almost be classed with a number of the later arrivals which really came to the station only to die and were never considered as being of any experimental value.

Judging from the conditions found on post-mortem a number of the other members of the original herd would, very shortly, have become active clinical cases.

The evidence on the whole leads to the conclusion that open air treatment is not likely to exercise any marked curative influence on animals already tuberculous, especially when reinfection is possible through cohabitation with clinical cases.

So far as concerns the securing of information regarding the extent to which healthy cattle kept in contact with diseased cattle are subject to infection, the experiment has proven of but little value. Had the seven healthy steers slaughtered in the fall of 1907, been allowed to remain with the herd throughout the whole experiment, the results would have been more interesting and valuable. It is true they lived for over two years in close contact with tuberculosis cattle without becoming infected; on the other hand, as most of the infection and reinfection, if such took place, apparently occurred during the year 1908, the fact that their slaughter took place when it did was very regrettable.

Of the other healthy animals, No. 31, a member of the original herd, was between October, 1905, and February, 1909, tested six times without reaction, and has since remained healthy, as has also her one calf; on the other hand, No. 22, which also came with the herd, after passing four tests without reaction, gave a positive reaction in February, 1909, and on post-mortem showed very clear evidence of recent tubercular infection.

Nos. 99 and 100, which entered the herd in May, 1908, and which were twice tested without reaction, showed on slaughter in December, 1908, no evidence of tubercular infection.

No. 102, however, which entered the herd in November, 1907, and which also underwent two tests without reaction, reacted positively in February, 1909, and when slaughtered showed distinct evidence of tubercular infection.

A careful scrutiny of the individual records of the calves reared on the station will reveal a very few cases which might indicate that infection possibly took place after weaning. Most of the calves, however, which became diseased, reacted at such an age as to indicate that they derived the infection direct from their dams.

In view of all the circumstances the evidence derived from this experiment, as to the likelihood of animals becoming infected under open air conditions, is of no great value.

The proportion of healthy calves raised from the whole herd, namely 60 per cent, is at first sight somewhat discouraging, but when it is remembered that, with one exception, No. 31, all the cows on which they were reared were affected with tuberculosis, that one had a tuberculous udder, and that a number of the others were open and clinical cases, the matter assumes a somewhat different aspect. It is, I think, highly improbable that such a large percentage of healthy calves could have been obtained from a herd of the same kind under ordinary stable conditions.

In conclusion, I would say that while the results derived from this experiment are on the whole somewhat disappointing, they are not without value, inasmuch as they furnish a good deal of useful information regarding the eccentricities of bovine tuberculosis, as well as on the use of tuberculin for diagnostic purposes.

I have the honour to be,

sir,

Your obedient servant,

J. G. RUTHERFORD,

*Veterinary Director General and Live Stock Commissioner.*



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## APPENDIX No. 19.

## INTERNATIONAL INSTITUTE OF AGRICULTURE.

J. G. RUTHERFORD, V.S., H.A.R.C.V.S.

OTTAWA, March 31, 1909.

SIR,—I have the honour to present my report as delegate from Canada to the Permanent Committee of the International Institute of Agriculture covering the period between the date of my appointment in May, 1908, and the last meeting of the Committee in November of the same year.

Although I was also a delegate to the General Assembly, I have not touched upon the proceedings of that body, with which you, as head of the Canadian delegation and vice-president of the Institute itself, are entirely familiar.

As you have informed me that you propose to deal in your annual report with the origin of the Institute and the earlier stages of its history, prior to the holding of the first regular meeting in May, 1908, I will, therefore, confine myself to a brief relation of my own experiences as a member of the Permanent Committee, and to such comments and remarks on the organization and work of the Institute as, in my opinion, are most worthy of note.

Leaving Ottawa on May 7, I proceeded to London, where through the courtesy of Lord Stratheona, High Commissioner for Canada, I was promptly put in touch with Lord Carrington, President of the British Board of Agriculture, and with other officers of his department interested in the work of the Institute.

I found that Sir Thomas Elliott, Permanent Secretary of the Board, and also the official delegate of Great Britain and Ireland, had already gone to Rome. As the date fixed for the first meeting of the Permanent Committee, namely May 23rd was rapidly approaching, I remained in London no longer than was absolutely necessary, and starting on the 19th, reached Rome on the evening of the 21st.

Immediately upon my arrival I presented my credentials to Sir Thomas Elliott, who, having been a member of the British delegation which attended the first meeting called in 1905 by His Majesty, the King of Italy, to consider and discuss the original project, was familiar with every phase of its history. He very kindly and courteously then and thereafter, extended to me the full benefit of his knowledge and experience, which, I need scarcely say, were of the greatest possible value, giving me, as they did, a grasp of the whole situation, which otherwise would have been difficult if not impossible of attainment.

I soon found that, as usual, when many men of many minds, and especially of many nations, are gathered together to discuss any project, there were many opinions, and many points of view. The natural tendency to divergence of thought under such circumstances, was in this case accentuated by the fact that the scheme under discussion was one of the most remarkable and extraordinary which had ever been proposed in the whole history of mankind.

That all the civilized nations of the world should unite in forming a cordial commercial union, for the purpose of conducting jointly a business office, and that in the Eternal City itself, was unquestionably a proposition to make men think. As the thinking was in full swing and was being done by thoughtful men, whose minds had all been trained in different schools, and whose views were coloured by their national,



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to say nothing of their individual, characteristics and environment, it is not surprising that the viewpoints varied widely, and that there were many different conceptions of the future work and wellbeing of the International Institute of Agriculture.

Ideas were in the melting pot and although the furnace was not yet in full blast, the process of solution had already begun.

Conferences were constantly being held, and discussions more or less animated, according to the national temperaments of those taking part, were everywhere in evidence.

It was soon apparent that unless the delegates of the greater nations could be brought to agree upon some line of policy reasonably definite and mutually satisfactory, before the actual meetings began, there would be more argument than action and but little hope of a logical outcome. Fortunately for all concerned, the delegates from the larger and more important countries were, almost without exception, men of sound sense, good judgment, and more or less diplomatic experience.

This being the case, compromise became the order of the day, and by giving here and taking there, the adoption by these gentlemen of a general policy, so far at least as the initial steps were concerned, was soon rendered possible.

On Saturday, May 23rd, the Institute was formally opened by His Majesty the King of Italy, Victor Emmanuel III, who was accompanied by the Queen and his Imperial suite, as also by many members of the Italian government and other prominent personages.

The opening took place in the magnificent building in the Villa Borghese, specially erected by His Majesty for the accommodation of the Institute.

This building, which was at that time scarcely completed but which was almost finished at the time of the later meeting in November, is an exceedingly handsome and commodious structure. From an architectural point of view, it leaves nothing to be desired, while it is sumptuously furnished and decorated throughout with fine specimens of modern Italian art. Its situation is excellent, commanding a beautiful view of St. Peter's and the Hills across the Tiber.

Speeches of congratulation on the successful opening of the Institute were addressed to His Majesty by M. Signor Tittoni, Minister for Foreign Affairs; Senator Count Faina, President of the Royal Commission, and His Excellency M. De Carvalho e Vasconcellos, Portuguese Minister at Rome, who, as the oldest member of the Diplomatic Corps had been selected to speak on behalf of the Foreign delegates.

In these addresses, as was perhaps natural under the circumstances, His Majesty the King of Italy was given the entire credit for the formation of the Institute, although among the delegates from other countries there was a very general feeling that the name of Mr. David Lubin, who first conceived the idea of such an international organization and to whose energy and enthusiasm its actual realization was due, might at least have been mentioned.

On Monday, May 25, the Permanent Committee met for the first time in one of the fine rooms of its new palace. The following is a list of the delegates present, the names of the countries being arranged alphabetically:—

Argentine Republic—His Excellency M. R. Saenz Pena, Argentine Minister of Italy.

Austria—M. le Chev. de Pozzi, Statistician to the Imperial Department of Agriculture.

Belgium and Luxemburg—M. O. Bolle, Director of the Department of Agriculture.

Bulgaria—M. C. Seraphimoff, Governor of the Agricultural Bank of Bulgaria.

Chili—M. L. S. Rodriguez, Consul General for Chili at Rome.

China—M. Tching Sound Tchai, Secretary of the Chinese Legation at Rome.

Costa Rica—M. R. Montealegre, Costa Rican Minister at Rome.



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Cuba—M. C. de Pedroso, Chargé d'Affaires de Cuba pres le Gouvernement Italien.

Denmark—M. H. H. Konow, Danish Consul at Rome.

Egypt—His Excellency Boghos Pascha Nubar.

France—M. Louis Dop, Asst. Chief of the Cabinet, Dept. of Agriculture, Paris.

Great Britain and Ireland—Sir Thomas Elliott, K.C.B., Permanent Secretary of the British Board of Agriculture, London.

Australia—M. J. W. Taverner, Agent General for Victoria in London.

Canada—M. J. Gunion Rutherford, Veterinary Director General and Live Stock Commissioner.

India—Sir Edward Buck, K.C.S.I.

Germany—Dr. Mueller, Member of the Upper Council.

Hungary—M. E. Miklos de Miklosvar, Former Secretary of State for Agriculture, and Member of the Upper House.

Italy—M. le Count E. Faina, Senator du Royaume.

Japan—M. M. Kameyama, Charge d'Affaires for Japan at Rome.

Mexico—M. G. A. Esteva, Mexican Minister at Rome.

Montenegro—M. G. Volpi, Director General of Monopolies of the Principality.

Netherlands—M. H. J. Lovink, Director General of Agriculture.

Norway—Dr. A. Fjelstad, landed proprietor and farmer.

Portugal—His Excellency M. de Carvalho e Vasconcellos, Portuguese Minister at Rome.

Roumania—M. Fleva Nicholas, Roumanian Minister at Rome.

Russia.—M. le Baron M. Korff-Schmising, Member of the Russian Embassy at Rome.

Spain—M. Echeverria Auguste.

Sweden—M. le Baron, C.N.D., de Bildt, Swedish Minister at Rome.

Switzerland—M. J. B. Pioda, Swiss Minister at Rome.

Servia—M. B. J. Soubotitch, Secretary of the Servian Legation at Rome.

United States of America—M. David Lubin.

The proceedings were opened by M. Pompilj, Under Secretary of State for Foreign Affairs, who briefly welcomed the delegates on behalf of His Excellency Signor Tittoni, Minister of Foreign Affairs, who was unfortunately ill and therefore prevented from attending in person. M. Pompilj asked that the delegates proceed to nominate a president and vice-president to the Permanent Committee, who might immediately enter upon their duties.

In reply His Excellency M. de Carvalho e Vasconcellos, delegate for Portugal, Dean of the Diplomatic Corps in Rome, who had, at an informal meeting of the delegates, been selected to speak on their behalf, expressed thanks for the courteous reception which had been extended to them by His Majesty the King of Italy and by His government, and great regret that His Excellency Signor Tittoni was unable to be present. He then proposed the name of Count Faina, the delegate for Italy, as president of the Permanent Committee of the International Institute of Agriculture, adding that he felt sure that in so doing he was expressing the unanimous sentiments of his colleagues.

Count Faina having been elected by acclamation, and having on motion, taken the chair, expressed his thanks to the assembly for the honour of his selection to direct the work of the committee, and the hope that, with their assistance, he would be able to justify the confidence which they had reposed in him. He then suggested the name of M. E. Koch, representative of His Majesty the King of Italy, and who had been, from the first, intimately connected with the work of the Institute, as a most suitable person to fill the office of Secretary General. This proposal was immediately adopted by the committee.



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The President then announced that two matters remained to be dealt with, namely the selection of a vice-president, and the choice of an official language.

Upon motion of M. Louis Dop, delegate for France, supported by Sir Thomas Elliott, delegate for Great Britain and Ireland, it was agreed that the nomination of a vice-president should be postponed until all the adhering countries had named their proper official representatives.

The question of the official language to be used in the meetings of the committee evoked considerable discussion in which many of the delegates took part. It was finally decided that French should be the official language of the Permanent Committee, but that delegates might be permitted, as an exception, to use another language in debate.

It was also decided that delegates should be permitted to introduce technical experts to assist them in their duties by explaining special matters, and should occasion require, by acting as interpreters.

The real business of the meeting then began.

With the view of facilitating matters, the Italian Government had, through a specially appointed Royal-Commission, prepared a project for the work of the Institute, copies of which had been previously sent to the governments of the adhering nations. This project, while expressing the views of Italy, found but little favour in other countries, inasmuch as in many respects, it was not in strict accordance with the provisions of the international agreement reached in 1905.

Many of the delegates had come to Rome with definite instructions to oppose this Italian project. The Government of France had devoted special attention to the subject, and had prepared a lengthy and comprehensive minute, which, while expressing the most friendly spirit towards and kindly interest in the Institute, pointed out that it would be impossible for the French representative to agree to many of the propositions embodied in the Italian project. In this minute the views of France were clearly and concisely set forth, and were undoubtedly entirely consistent with the terms of the convention.

The instructions of many other delegates were generally in accordance with the views of France, and the Italian project was finally rejected as a basis of discussion, its place being taken by a new project, prepared, so far as the first meeting was concerned, by a special sub-commission selected from among the delegates to the Permanent Committee.

A copy of this will, I presume, be embodied in the historical portion of your own report. This being the case, I have not thought it advisable to reproduce here either the Italian project, or the French criticism of that document.

The debate which led up to the appointment of the special sub-commission, above referred to, was very interesting, and, as it embodies in full the opinions of the French and German delegates, and, in this way, throws much light upon the objects of the Institute, I have thought it advisable to include it in my report.

On the following day, May 26, M. Lovinck, delegate from the Netherlands, proposed the following resolution:—

‘Whereas, it will be necessary to convoke the General Assembly of the International Institute of Agriculture during the current year, in order that the Institute be not delayed in exercising its proper functions; and

Whereas, having this in view, it would be desirable to present to the adhering governments, as soon as possible, a definite plan of organization, and a programme of the work to be done, in order to give them time to approve the same and to give the necessary instructions to their respective delegations; and

Whereas, the Permanent Committee would find itself confronted by grave difficulties if it attempted to deal with all the details of a definite project in the course of general discussion;



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Therefore the Permanent Committee after having summarily discussed the project presented by the Royal Italian Commission, resolved as follows:—

First—To name a Commission *ad hoc*, composed of twelve members and charged with the preparation of the details of the plan of organization and of the operation of the Institute, taking into account the wishes and proposals expressed in the general discussion, as also the Italian project. (Members of the Permanent Committee from each country to have the privilege of taking part in the sittings of the Commission.)

Second—To ask the Commission to work in such a manner that the propositions relative to the organization of the programme of work and to the financial budget might be submitted with the least possible delay to the Permanent Committee.'

He presented at the same time, a list of twelve delegates whom he suggested as members of the Commission.

M. Louis Dop, delegate from France, explained the reasons why he could, so far as he was concerned, accept the proposition of M. Lovinck only on condition that all the members of the Committee might be admitted to take part directly in the work of the Commission, and asked that the nomination of the Commission should be deferred until the Permanent Committee had finished the general discussion of the plan of organization of the Institute.

M. Fleva, delegate from Roumania, while fully appreciating the arguments advanced by M. Dop, pressed the Committee to divide the two questions. He proposed to enter immediately into a general discussion of the Italian project, and to reserve until afterwards the question of the names of the Commission.

M. Louis Dop, delegate for France, agreed and together with M. Lovinck, submitted to the Committee the following proposition:—

'The Permanent Committee resolves to proceed to the general discussion of the plan of organization, taking for a basis, the project prepared by the Royal Italian Commission.'

M. De Carvalho e Vasconcellos, delegate for Portugal, emphasized the necessity of having rules of order and proposed to adopt, as provisional, those used in the discussions of the International Conference of 1905.

The President, after reading the Rules of Order of 1905, pointed out that some of these were not applicable to the present case.

The proposition of the Portuguese delegate was, however, unanimously accepted.

The general discussion upon the Italian project was opened by M. Louis Dop, delegate from France, who spoke as follows:—

'The government of the French Republic, which has done me the honour of appointing me as its delegate to the International Institute of Agriculture, took part in the most thorough and active fashion in the initial steps for the creation of this Institute in June, 1905.

France is proud and happy in the thought that most of the propositions made by her in the conference of 1905, were accepted, to form, with the consent of the adhering states, the Articles of the final Act, which, to-day, governs our proceedings.

The prominent part which my country played in 1905 in furnishing a happy solution of the problem which was submitted to the deliberations of the conference, imposed on France the direct duty of manifesting, from the beginning, her intention of co-operating steadily in the grand work for which we are now gathered here. This is the reason why the government of the French Republic has, as in honour bound, assumed the agreeable duty, of nominating a permanent delegate to the International Institute of Agriculture from the moment of its being notified of the meeting of the Permanent Committee.

It is for me an honour to represent here the agricultural interests of France. This great honour confers upon me at the present moment the pleasure of interpreting faithfully the sentiments of profound gratitude which fill the hearts of all the



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French people for the noble initiative of His Majesty the King of Italy, Victor Emmanuel III. This sentiment of appreciation will remain in the hearts of my compatriots the good peasants and farmers of our beloved France eternally, like the great royal work which is to-day crowned with success in so complete a fashion.

France experiences also a sweet emotion at the thought that the generous initiative of the beloved sovereign of a beloved nation has conferred upon humanity a new instrument of union, of universal peace and concord. We must to-day assure ourselves of the proper progress and operation of this instrument.

Animated as we all are with a lively desire and firm wish to have our respective countries benefited by the new institution, we must be inspired in the performance of our duties by the spirit of understanding and solidarity, and the sentiments of devotion to our united interests, which have animated the Royal Italian Commission and its eminent President, Count Faina.

In the name of France I proffer to our sympathetic President and the members of the Commission which he has directed with so much ability and distinction the homage of gratitude.

I would fail also in a very agreeable duty if I did not observe that our very distinguished Dean, His Excellency the Portuguese Minister, M. de Carvalho e Vasconcellos has interpreted faithfully and eloquently our common sentiments. I trust that he will permit me to proffer him the sincere thanks of my country, as I also address them to our excellent colleague and friend M. Lubin, whose generous and far-sighted idea permits us to-day to know each other better and therefore to esteem each other more.

We must not however permit ourselves to believe, gentlemen and dear colleagues, that our institution is a mutual admiration association; now that the duties of gratitude have been accomplished we must go to work with a view of showing to the farmers of the entire world that we are fully conscious of, and have a definite idea of our duties and of the responsibilities which rest upon us.

What should be our method of work? What principles should direct our efforts in searching for a satisfactory and early solution of the problem submitted to us?

Gentlemen, the beauty of this palace which we owe to royal munificence is emphasized and illumined by a series of happy mottoes which remind us that Italy is also the land of classics to which we owe the greater part of our intellectual culture.

In order to inspire and direct our labours I would have wished to suggest to the able architect of this palace that a motto, less literary but more symbolical, should have been inscribed on the wall of the chamber which shelters us and our duties.

The sentence which I have in mind is a synthetical and concise expression of the decisions of the Conference of 1905, namely:

‘The Institute is a State Institution.’

From these words is derived the essential principle contained in the last paragraph of Article 9:—

‘All questions relating to the economic interests, the legislation and administration of any particular state, must be excluded from the sphere of the Institute.’

These two great fundamental principles constitute the very spirit of the final act of the Conference of 1905.

It follows therefore that we must consider this Act as a constitutional charter, a guarantee of our independence and our liberty, a charter to inspire, to direct and to limit our decisions and our acts.

From the point of view of the French Government, all the decisions of the Permanent Committee should flow from these sources, as a corollary follows the demonstration of a given theorem.

We are here, gentlemen and dear colleagues, in an assemblage where science, pure and simple, should be the inspiration of all our acts.



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You will therefore regard as only natural my endeavour to apply to our work the method of Descartes, which can be perhaps for us a guiding thread through the labyrinth of ideas and projects arising from the problems submitted to our deliberations.

The essential principle of the Cartesian method is, as you are aware, that of elimination.

Let us then eliminate from our programme everything which is not strictly included within the letter and the spirit of the final act of 1905.

What must we eliminate?

(1) The details of the organization and operation already provided for in the Convention of 1905;

(2) The details of operation incompatible with a state institution, as for example, official or private correspondence of the Institute, taken from sources other than official or those under official control;

(3) All the details of organization and of registration of agricultural labour outside of the special case of the rates of pay expressly provided for by the Act of 1905;

(4) All acts or decisions empowering the Institute to initiate meetings of private associations;

(5) Any intermediary role between associations or co-operative societies;

(6) Every procedure which might possibly confer on the Institute the power of communicating with States, otherwise than through the medium of official delegates, or to receive directly information from private associations, otherwise than through the official medium of governments.

Such is, gentlemen, in the opinion of the French government, the negative part of our programme so far as refers to scientific questions, an opinion which I shall have the honour to explain and defend, as the various questions come up for discussion.

But have no alarm gentlemen; the programme conceived by the French government will not be a negative programme.

Our scientific method of elimination can only result in the adoption, according to the Pasteur school, of a method of reconstruction, capable of giving body and soul to the different living elements.

Let us then adopt, for the formation of the concrete and practical part of our programme, the experimental method, which is alone capable of keeping us free from self deception, and of assuring the ultimate success of our decisions.

If we rigorously apply this method, we need only provide for the Institute such working parts as will enable us to immediately attain our purpose.

Now experience and reason teach that the only goal immediately attainable is the grouping or amalgamation at the Institute of all the statistics gathered by the different countries, possessing at the moment an official service of agricultural statistics and information.

A majority of the great States of Europe and America have already organized in their respective countries such offices of statistics and information.

Let us confine ourselves for the moment to the creation at Rome of a Bureau of centralization, of comparison and of unification of these different informations. In doing this we shall have already accomplished a very important work sufficient in any event to occupy, during its first stages, the energy of the Institute.

Let us leave to the future the care and development of the seeds sown in a fertile and well prepared soil.

'Let us be modest' is the formula of our success.

Let us study to confine our ambition to results easily and speedily realized. Let us consider only as a desirable, but at present an unattainable ideal, the various functions of acting as an intermediary between associations, of acting as a Bureau of emigration, as an inspirer of congresses, as a regulator of prices and markets, or in the



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formation of unions and federations among associations and co-operative societies, etc., such as some generous spirits would wish to have our Institute undertake.

Let us, for the present, leave these functions to the different States and leave to the statistics which we shall publish and to the farmers who will read them, the task of drawing practical conclusions which these official statements contain.

As regards the practical organization of our offices, the French government would willingly agree from the inception of the work of the Institute, to the formation of five bureaux, as follows:—

(1) Bureau of the Secretary General; internal administration; staff and material; accounts.

(2) Library, archives, printing, distribution of printed matter, department of publications, bibliography.

(3) Bureau of agricultural statistics, charged with paragraphs (a), (b) and (c) of Article 9 of the Convention.

(4) Bureau of plant diseases charged with paragraph (d) of Article 9 of the Convention.

(5) Bureau of co-operation, of assurance and of agricultural credit, charged with paragraphs (e) and (f) of Article 9 of the Convention.

Such are, gentlemen and dear colleagues, the scientific principles which have inspired and directed the precise instructions which I have received from the French government, with the view of reaching rapidly a practical and easily attainable result. I am persuaded, gentlemen, that we will be wise enough to take as an inspiration that great and generous motto the “*unita d'intento*,” which, at the call of Mazzini, enabled Italy, this great and noble nation, to realize her unity.

We also will be wise, gentlemen, to realize this “*unita d'intento*” which, according to the poetic expression of our distinguished and sympathetic President, Count Faina, will enable us to put into practice human solidarity, and we shall see dawn the long wished for day when the different social classes who labour together in the cultivation of the soil shall unite in garnering the wheat.

Gentlemen, and dear colleagues, will you excuse me? I have been perhaps a little long and the weather is warm.

We, however, who represent the toilers of the soil, do not fear the heat. With the great poet Carducci, we love the rays of the bright sun of Italy, whose rays fertilize and fecundate the heavy labours of the workers of the fields, and whose same beams will also reward our earnest efforts with a rich harvest of blessings of which, later, humanity will be proud.”

At the afternoon session, Dr. Mueller, delegate for Germany, spoke as follows:—

‘Gentlemen, it is my duty to first declare that I share entirely, as do we all, the sentiments of appreciation towards His Majesty the King of Italy, the Italian government, the Royal Commission, and above all towards our President, sentiments which M. Louis Dop has interpreted in a manner so eloquent and sympathetic.

In my opinion the object of our discussion is to give suggestions to the Commission, which we are about to name. This is my reason for explaining the points of view which will guide me in taking part in the work of the Permanent Committee, with, I may add, the entire approval of my government, which leaves me otherwise quite at liberty to seek, in common with my colleagues, the means necessary and useful to develop our Institute and, in a word, to protect and second the common agrarian interests of all the countries which have adhered to the International Institute.

I believe that the most important work of the Institute will be the organization of a service of information concerning the extent of cultivated land, the crops, the prices of and commerce in the principal agricultural products.

I have no doubt that this service, if well organized, will immediately be of great advantage to the interests of farmers and to the general economy of the whole world.



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This service being the most important of all those authorized by Article 9 of the Convention, I am of opinion that the greater part of the material and personal forces of the Institute, should from the first, be devoted to its inauguration.

For the other services, it will be sufficient to collect exact data upon practical and scientific progress throughout the world and to distribute them as widely as possible by publications, either periodical or as often as it is thought necessary.

As regards the work of the Institute in general, I believe that it will be necessary to confine ourselves strictly to the provisions of Article 9 above mentioned, although this will not prevent us from giving our attention to questions which, while not literally enumerated in that article, are without doubt therein implied.

As for the data which are to be placed by each state at the disposal of the Institute, it is absolutely necessary, in my opinion, that these must be authentic, rapid and punctual, and that consequently there can be only taken into consideration data of which the authenticity is recognized by the state communicating them.

As for the operation of the Institute, I think it is necessary, to utilize the scientific and practical experience and the special methods of work of the different nations, an international principle from which we have already profited in forming the Permanent Committee, and which should also be of great use in the composition of the different bureaux.

As for the organization of the bureaux, with the view of simplifying our work as much as possible, I believe that it will suffice for the present, to form three divisions, namely:—

(1) Division of the Secretary General, which will take charge of the general administration, the library, the publications, accounts, and of the supervision of the staff.

(2) Division for the securing of information regarding the principal agricultural products and plant diseases.

(3) Division dealing with information regarding economic and social institutions and questions concerning manual labour.

Lastly, with the view of ensuring the effective co-operation of persons of outstanding ability, I believe that it will be useful to put the three chiefs of divisions under the direct control of the Permanent Committee.'

After Chevalier de Pozzi, delegate for Austria, had expressed his sympathy with the views of Dr. Mueller, M. E. Miklos de Miklosvar, delegate for Hungary made, in his turn, the following declaration:—

'Our International Institute of Agriculture, divested of all political considerations, will serve, I am sure, as a bond of union between the peoples, rendering their relations more cordial, and assuring an extension of the ideas of co-operation and mutuality, the application of which to agriculture appears to be the characteristic of modern times and the principal cause of the greater part of the progress which has been made.

The role of the International Institute may be in the future very considerable, but it is necessary that our activity be limited at the commencement, that we walk slowly but surely, and that we hold strictly to the provisions of Article 9 of the Convention. 'He who goes slowly goes safely,' says the Italian proverb. Let us never lose sight of the fact that we must always remain on a solid foundation and that we can only work with the aid of correct and controllable data furnished by the different governments.

We shall have nothing to fear if we travel a path solid and well defined.

Our business will go without difficulty if God is our help and science our guide.

As regards the internal organization of our Institute and its operation, I am convinced by the forces of facts, as also by my personal knowledge of different countries that we can for a beginning, concentrate our work in two great divisions, namely:—



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(1) Agrarian information.

(2) Agrarian questions and institutions of economic social nature.'

Sir Thomas Elliott, delegate for Great Britain and Ireland, declared that he fully shared the ideas set forth by his colleagues of Germany, Austria and Hungary, and believed also that the functions of the Institute should above all be devoted to the securing of statistics, but that it was very necessary to distinguish between statistics of a static order and statistics of a dynamic order.

He hoped that the Institute would confine itself to these last, that is to say to living statistics. This would be the surest way of observing in its true spirit the Convention of 1905.

The President thanked the delegates for the kind words which had been pronounced in reference to him, and with a view to answering in a complete fashion the remarks which had been made, asked M. Louis Dop, to indicate point by point the difference which existed between the project of the Royal Italian Commission and the ideas of his government.

M. Louis Dop, delegate from France, remarked, firstly, that the Italian project reproduced the articles of the Convention of 1905, and pointed out that the reproduction of these articles was useless.

Upon the declaration of the President that these articles were not an exact reproduction of the articles of the Convention of 1905, M. Louis Dop asked in the most formal manner that the articles of the Italian project might be considered in such a way as to preserve in future discussions the full force of the article of the final Act of 1905. He expressly requested that this reservation should be inserted in the minutes.

The President stated that in order to conform to article 5 of the Convention quoted, it would be necessary to prepare a project of organization and operation for the Institute.

Article 8 of the Convention stated that the Committee makes its own rules of order. The Royal Commission believed that for the rules of order of the Permanent Committee it was best to hold closely to the procedure fixed by the Convention. This, however, does not imply a renewal of the discussion of these principles. On the contrary their reproduction should be considered as a confirmation of their full strength. He was quite satisfied that he would be given an opportunity of explaining to the Assembly that the intention of the Royal Commission was not and should not be considered a modification in any way of the letter or the spirit of the Convention.

M. Louis Dop called the attention of the Permanent Committee to another point marking the difference between the two projects. He thought that everything concerning statistics should be centralized in a single bureau, as well as all information regarding agricultural products and rural labour. In fact, following Article 9 of the Convention, the task of the Institute, as far as concerns labour, should be limited to the statistics of agricultural wages, whereas in the Italian project the data relative to emigration, permanent and periodical, are discussed.

The President explained the principles followed by the Royal Commission, which had to recognize that it would have been very difficult and almost impossible to determine exactly the wages of rural labour, because of the numerous and different elements employed to establish the measure and the real value of these wages which are often paid in kind and which vary in each country and in each season, both in regard to different agricultural operations and to what the English call the 'standard of life.' So much the better for the work of the Institute if the Permanent Committee can find the means of collecting and presenting exact and precise data. The Royal Commission had recourse to data relative to emigration in order to determine to what extent it was affected by the law of supply and demand.



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M. Louis Dop, delegate from France, stated that very precise data as to the rates of agricultural wages are furnished to the Department of Agriculture of the Republic. On the other hand, one can only give what one has. He insisted upon the convenience of concentrating in the Bureau of Statistics data relative to manual labour.

As far as concerns the organization of the services, differing from his colleagues of Germany and Austria, he was of opinion that it would be necessary to establish a special bureau for diseases of plants.

Many questions of a statistical kind, but above all of a technical and scientific nature, applied to the argument that it is not convenient to group data relative to the diseases of plants in the Bureau of General Statistics.

M. Konow, delegate from Denmark, stated that his government had instituted a special bureau charged with furnishing information to the International Institute of Agriculture and with the distribution of information, which, in its turn, the Institute would undertake to furnish. He thought that other countries should form similar bureaux, to serve the Institute, which, only by such means would be able to fulfil its functions in a complete and effective manner.

His Excellency Boghos Pascha Nubar, delegate from Egypt, stated that in the preceding sitting the committee had decided to only open a general discussion upon the project of the rules and organization of the Institute. They should, therefore, confine themselves to declarations of a general order, and if no one had anything more to say, it only remained to nominate the commission mentioned in the proposition of the delegate from the Netherlands.

The President read again the text of this proposition and asked the committee if it wished to elect by acclamation the list of members of the proposed Commission, handed to him by Mr. Lovinck.

Mr. Louis Dop proposed to add to the list the names of the delegates from Spain and Denmark.

The list being put to the vote was approved by acclamation.

It is as follows:—

- (1) His Excellency Boghos Pascha Nubar, delegate from Egypt.
- (2) Sir Edward Buck, K.C.S.I., delegate from India.
- (3) M. O. Bolle, delegate from Belgium.
- (4) M. Louis Dop, delegate from France.
- (5) Sir Thomas Elliott, delegate from Great Britain and Ireland.
- (6) Count E. Faina, delegate from Italy.
- (7) M. Fleva Nicolas, delegate from Roumania.
- (8) M. H. J. Lovinck, delegate from the Netherlands.
- (9) M. E. Miklos de Miklosvar, delegate from Hungary.
- (10) M. le Mueller, delegate from Germany.
- (11) M. Chevalier de Pozzi, delegate from Austria.
- (12) M. J. Gunion Rutherford, delegate from Canada.
- (13) M. Echevarria Auguste, delegate from Spain.
- (14) M. H. H. Konow, delegate from Denmark.

May 28, 1908.

The President proposed to the Permanent Committee to add three members to the Commission named on the 26th, to wit, His Excellency M. Saenz Pena, delegate from the Argentine; M. le Professeur Vieira Souto, delegate from Brazil and M. G. S. Estava, delegate from Mexico.

The President's proposition was approved.

The President further announced that the Commission above mentioned had nominated a sub-commission consisting of the delegates from France, Germany and Great Britain and Ireland, charged with preparing a general plan of the rules of order of the Permanent Committee. This general plan having been edited, and the Commission having decided to submit it immediately to the Permanent Committee,



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the President stated that it would be distributed as soon as possible to the members of the Committee at their respective residences in order to allow their examining it and discussing it the next afternoon.

May 29, 1908.

The President opened the general discussion on the plan of the rules of order for the Permanent Committee as edited by the sub-commission.

His Excellency M. Boghos Pascha Nubar, delegate from Egypt, then read the following declaration:—

‘Gentlemen,—The project submitted to us by the sub-commission far exceeds in importance the work which it was asked to perform. It was charged by the Commission with the elaboration of the simple interior rules of order for the Permanent Committee, but our colleagues, without being checked by the surfeit of work imposed upon them, have enlarged the scheme and have at the same time drawn up a project for the organization of the different bureaux and services of the Institute.

In drawing attention to this fact my intention is not at all to criticise, but rather to bestow a well merited eulogy and above all to thank our colleagues of the sub-commission for the immense mass of work which they have performed in so short a time with an activity and devotion which I am sure we ought to recognize.

Each of us has certainly reflected on the questions which present themselves regarding the organization of our Institute and has sought, as I have sought, to find a solution as simple and as free from complication as possible, with a view of making easy in practice the application of rules of procedure in accordance with our Convention of 1905.

For my part, I have reached a conclusion that it would be difficult to separate in this work the interior procedure of the Permanent Committee from the general question of the organization of the Institute. I think that the questions overlap to such a degree that the best solution, the one which would eliminate every complication and every practical difficulty, would be to combine them and have only one general constitutional organization. My intention was to propose this to the Committee. I may, therefore, tell you how pleased I am that the sub-commission has arrived at the same conclusion and that better still, it has prepared the complete project which is submitted for your deliberations. I shall permit myself, during the discussion of the articles, to make some observations and perhaps to ask some modifications, but before passing to that discussion, I wish to thank my colleagues of the sub-commission for the spirit which has reigned in the editing of this project and in a very special manner on account of the articles governing vote by state in the commissions. In proposing that this vote be made by state and giving a single vote to each delegate and not the number of votes fixed by the group to which he belongs, our colleagues of the sub-commission, who all three belong to the first group, and have in consequence the right to five votes each in the Permanent Committee, have given the best evidence of the sentiments of equity and liberality which animates them towards the delegates from states belonging to less important groups. This breadth of view, which, I have no doubt is shared by our other colleagues, is to us, a sure guarantee of the spirit and the sentiments which will govern our labours and therefore of the success of our Institute.”

M. Miklos de Miklosvar, delegate from Hungary approved the sentiments expressed by his colleague, the delegate from Egypt, regarding the excellent work accomplished by the sub-commission, but thought it his duty to make certain suggestions as to the organization of the Institute, differing in some degree from the principles laid down by the sub-commission and proceeded to read these in detail.

From this time on the Permanent Committee devoted itself entirely to the discussion of the rules of order and the organization which had been prepared by the sub-commission of three.



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These comprised (1) the official language; (2) the powers and duties of the President, Vice-President and Secretary General; (3) the convening and procedure of the Permanent Committee;

(4) The organization of the Institute itself, the Committee recommending three divisions:—

(a) That of the General Secretary;

(b) That of statistics and general agricultural information, including plant diseases;

(c) Social and economic institutions, including agricultural co-operation and credit;

(5) The appointment of a sub-commission for the control of each of these three divisions;

(6) The engagement, qualifications, payment, and general control of the staff.

All these subjects were discussed in the greatest possible detail. The position, duties and status of the officers to be engaged, the terms of engagement, salaries, pensions, vacations and matters of a like nature, especially evoked many eloquent orations.

These discussions as a whole, occupied five lengthy sessions, at the end of which but little progress had been made in the task of deciding upon or defining the actual work which the Institute was supposed to perform.

On the afternoon of June 6, being of opinion that there had been more or less waste of time, and that the energy and effort which had been expended in discussing these apparently minor details, might better have been devoted to the consideration of the actual work of the Institute, in a larger sense, I felt it my duty to address the committee as follows:—

‘Mr. President, as the representative of Canada, I desire, before the close of this gathering, to have the opportunity of making a few brief remarks with reference to certain phases of the work connected with the establishment of the International Institute of Agriculture, some of which have been dealt with, while others have been ignored, in the discussions of the committee in which hitherto I have taken little part.

In the first place, I desire to express, on behalf of the Government and the people of Canada, our appreciation of the noble and magnificent generosity shown by the King of Italy and his Government, in the manner in which the International Institute of Agriculture has been initiated and endowed.

The original conception of Mr. Lubin, noble as it was, would in all probability have remained, at least for many years, only a beautiful dream, but for the appreciation and support bestowed upon it by our friends of Italy, promptly seconded as they were by the other nations, who showed themselves quick to realize the gigantic possibilities of the idea.

As a rule, great bodies move slowly, and while true of corporations and even of nations, this old adage has scarcely been verified in the present instance, involving as it does the united action of practically the whole civilized world. It is but a little more than three short years since the proposal was first made public, and we now find ourselves gathered from all quarters of the globe, established in a comfortable, handsome and permanent home, well advanced in the work of organizing what to the minds of thinking men is undoubtedly the greatest and most benevolent international scheme which has ever been conceived and the wide possibilities of which it is utterly impossible to overestimate. When one considers the many difficulties attendant upon the assimilation of the many widely different ideas which converge in an assembly of this kind, the progress which has been made is undoubtedly most gratifying, and reflects the greatest possible credit upon the working members of this committee, especially upon those of the sub-committee which worked almost day and night, labouring earnestly to prepare the exhaustive ‘reglement’ which has been the subject of discussion during the week just passed.



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While in view of this earnest and conscientious work and its undoubtedly great results, it may appear somewhat ungrateful to venture into the field of criticism, I may be pardoned, as the delegate of a young, though vigorous and rapidly growing agricultural nation, in which the instincts of business are perhaps more fully developed than those of sentiment, if I venture to suggest that the work achieved at this meeting, although unquestionably of great value, has been conducted on somewhat different lines from those which it might reasonably have been expected to follow.

Having travelled a much greater distance than any other delegate here present for the special purpose of securing for the Government of Canada definite and reliable information as to the exact nature and scope of the work for which this Institute has been created and which it is expected to perform, I am naturally somewhat disappointed at being compelled to return to my country possessed of but very little more practical information than I had before leaving home.

We have, as I have already stated, magnificent quarters and we have now as a result of our labours during the past fortnight a scheme fairly complete for the conduct of the office work of the Institute, but as to what that work is really to be, and as to how each of the adhering governments has to arrange for the performance of its share of that work, we have even now no practical or definite knowledge.

Speaking as a business man, and as one who has had a considerable experience in public affairs and in the organization of official work, I cannot refrain from expressing the opinion that it would have been better to devote more time to the consideration of the actual work of the Institute than to the many little details of its 'fonctionnement' and the classification and management of its officials, matters, which from my point of view, might with reasonable safety have been left largely in the hands of the Secretary General, and the other principal officers of the staff, who, if the Institute is to succeed at all, must be men of business capability, progressive ideas and above all sound common sense.

It may be said that this suggestion might have been made at an earlier stage of the proceedings, when action upon it might possibly have been taken. To this criticism I can only reply that, looking as I did upon the discussion and adoption of the 'reglement' as very largely a matter of form which would be generally accepted without much discussion, I was under the impression that ample time would be afforded for the consideration of the real work of the Institute, in accordance with the suggestion made by the honourable the delegate from the Netherlands, at our first meeting.

I feel the more keenly in regard to this matter because my chief, the Honourable Sydney Fisher, Minister of Agriculture for Canada, keeping in view the possibilities of this Institute, in the organization and development of which he has from its inception taken a keen interest, is contemplating a complete revision of the work of securing agricultural statistics in Canada. The organization of this service, which, while under existing conditions, entirely satisfactory from a national point of view, might perhaps be improved for international purposes, has been held in abeyance in the hope of this meeting deciding upon a definite plan, involving such a simplification and assimilation of the agricultural statistics of each adhering country, as would secure at least reasonable uniformity in the manner and method of their periodical presentation to this Institute.

Another point on which I think it is essential that a clear understanding should be reached, is as to the exact relations between the members of the Permanent Committee as individuals, on the one hand, and the Institute and its officers on the other.

While the Permanent Committee, acting as a body, must necessarily have full and complete control over the Institute, its conduct and its affairs, it should, I think, be laid down as a sound business principle that an individual member, as such, shall not interfere in any way with the work of the Institute or its employees. The proper accomplishment of the work for which the Institute has been created depends entirely on the existence of an absolute security that the information of which it is to become



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possessed will reach the public only at such times and through such channels as may be decided upon by the Institute itself. This being the case it is of the utmost importance that any outside interference with its officials should be absolutely impossible, and that the discipline maintained among the staff should be of the most rigid character.

I do not know, Mr. President, whether or not I shall again attend a meeting of the Permanent Committee; I trust that at the November meeting, it will be possible for my minister himself to take part in your deliberations. Meantime, I desire to thank you, on behalf of myself and my colleagues, for the uniform kindness and courtesy with which we have been treated during our stay in Rome.

I would add that we who live across the Atlantic will continue to watch with interest and appreciation the progress of the great work, to which the King and Government of Italy have given such a noble impetus.

Baron Bildt, delegate from Sweden, seconded by M. Louis Dop, delegate from France, moved the following resolution:—

‘With the view of assuring, from the foundation of the Institute, the progress of the different technical services, the Committee decides to entrust to the editing committee the task of establishing a definite and precise programme of the different statistical informations which will be asked from the various states and of presenting this programme, with the shortest possible delay to the Executive, who will be charged with forwarding it immediately to the delegates of the different states.’

His Excellency Boghos Pacha Nubar, delegate from Egypt, was of opinion that the task entailed in this proposition might with advantage be entrusted to the Commission charged with the definite editing of the articles and of the project relative to the pensioning and insurance of officials, and suggested the following modification:—

‘With the view of securing a definite edition of the rules of order of the Institute, as also the two projects relative to the pensioning and insurance of officials and the Budget, the Permanent Committee names a special commission of eight members, whose powers will commence from the actual adjournment of the Permanent Committee and will expire at the date of its first meeting in the month of November next.’

This modification having been accepted by Baron Bildt and M. Louis Dop, was put to the vote and approved.

The following gentlemen were elected by ballot as members of the commission:—

The delegates from Germany, Argentina, Austria, Belgium, United States, France, India and Italy.

After the discussion of some minor matters, it was decided on the suggestion of the President, that the General Assembly should be convoked between the 20th and 30th of November next, and that the meeting of the Permanent Committee should precede such convocation by ten days.

M. C. e Vasconcellos, delegate from Portugal and Dean of the diplomats present, asked leave to give expression to his sincere sympathy and regard for the President, who had directed the sittings of the Committee so wisely and equitably, for his colleagues for the spirit of conciliation which they had shown in the course of the debates, and lastly for the Secretary General and his co-workers who have contributed in so distinguished a manner to the rapid progress of the work. He had no doubt that these sentiments would be shared by all the members of the Permanent Committee.

The President then spoke as follows:—

‘Gentlemen and dear colleagues, I thank you all from my heart for the good will which you have been so willing to show to me and I particularly wish to thank His Excellency the delegate from Portugal for the very kind words which he has uttered regarding me. If, at times, I have not been able to perform with satisfac-



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tion the duties which you have done me the honour of entrusting to me, I beg that you will not attribute it to lack of good will.

'I am greatly pleased that the International Institute of Agriculture has given me the opportunity of renewing old acquaintances and of acquiring new, as also of appreciating the eminent qualities of which the gentlemen representing the various adhering states have given proof.

'In the name of my government and of the public opinion of my country, I pray you gentlemen to convey to the various countries which you represent our sincere regard.

'Thanks to your governments, it has been possible to give to the generous idea initiated by His Majesty the King, my august sovereign, a concrete form, and to place it upon a practical basis. Thanks to you, this great work of peace and solidarity has overcome its first difficulties which are always the greatest. It is now in progress and nothing will stop it, if you are willing, as I am sure you are, to aid it as you have aided it in the initial steps, with your experience and marked ability.

'This being the case, I do not say "Adieu" gentlemen and dear colleagues, but "Au revoir" and that soon.'

The Permanent Committee then adjourned.

The Commission of eight which was composed of Senator Count Faina, delegate for Italy; Dr. Muller, delegate for Germany; M. Louis Dop, delegate for France; Sir Ed. Buck, delegate for India; Mr. David Lubin, delegate for the United States; M. O. Bolle, delegate for Belgium; M. Chevalier de Pozzi, delegate for Austria; M. R. Saenz Pena, delegate for the Argentine Republic; met for the first time on June 11, the only member absent being Sir Edward Buck, who had found it necessary to leave Rome.

At this meeting the principal subject discussed was that of the best mode of soliciting from the governments of the various adhering states statistical information desired for the use of the Institute.

Propositions embodying definite interrogatory schedules were presented by Dr. Mueller and M. Bolle, but after some discussion both were rejected on the representations of Count Faina to the effect that the Italian Government had already sent out to the adhering governments, a series of questions, the answers to which in detail would serve the required object.

It was then decided to entrust to M. Louis Dop and M. Bolle the final editing and harmonizing of the articles of procedure approved by the Permanent Committee; to Dr. Mueller the working out of a system of pensions for officers; to Count Faina the study of systems of insurance, while to Count Faina and Dr. Mueller were also entrusted the preparation of the Budget; reports on all these subjects to be submitted to the Commission in the month of October.

The sub-commission next met on November 4, all the members being present with the exception of the delegate from the Argentine.

At the sessions, which lasted until November 9, there were also present from time to time, M. H. H. Konow, delegate from Denmark, Sir Thomas Elliott, delegate from Great Britain and Ireland, Dr. A. Fjelstad, delegate from Norway, and myself as delegate from Canada.

The work of the Commission at this time consisted entirely of a careful review of the rules of order and of the general plan of the work of the Institute, the latter comprising the various Permanent Commissions to be entrusted with the different branches of the work, the allotment of the staff and the Budget.

As all these matters were again fully discussed in the Permanent Committee and embodied in the report made by that body to the General Assembly, of which you yourself were a member it is scarcely necessary to further allude to them at present.

The Permanent Committee was formally convened on November 16, delegates of thirty-one countries being present.



## SESSIONAL PAPER No. 15b

The President announced the addition to the membership of the Institute of the Republic of San Marino and the Italian colonies of Erythrea and Italian Somaliland.

It was agreed that as a special privilege the delegates from the United States, China and Japan should be assisted by their private secretaries.

The orders of the day having now been reached, the President announced that the first duty of the Commission was the nomination of the Vice-President. On motion of M. Estava, delegate from Mexico, seconded by M. Miklos de Miklosvar, delegate from Hungary, action on this head was postponed until after the session of the General Assembly, when the regulations of the Permanent Committee should be approved.

M. Louis Dop then read on behalf of M. Lubin, delegate from the United States, a communication giving the views of the country on the organization of the Institute.

The consideration of the rules of order, as edited by the Commission of eight, was then begun by another lengthy discussion on the question of the official language to be used in the debates of the Permanent Committee, Mr. Taverner, delegate from Australia, being the principal opponent of the adoption of the French language. The clause containing this provision was, however, formally passed with a slight verbal amendment which appeared to satisfy Mr. Taverner.

The committee then devoted itself to a rapid but careful consideration of the rules of order of the Permanent Committee and the organization of the Institute, its various permanent sub-commissions and its staff.

These matters having been disposed of, subject to the approval of the General Assembly, the question of the Budget came up for discussion on November 18.

On this subject Dr. Meuller, to whom in conjunction with the President, the task of preparing the Budget had been entrusted, contributed a most comprehensive and exhaustive statement. In this statement he entered fully into a consideration of the Institute from various points of view. In fact so interesting and illuminating was his address that I have deemed it advisable to translate and present it here.

The allusions which he from time to time makes to the budget, while perhaps by themselves somewhat obscure, will be easily understood on referring to that document itself, which will, I presume, be embodied together with the rules of order and plan of organization in your own report of the proceedings of the General Assembly.

He spoke as follows:—

‘Gentlemen,—The Commission of eight which you have charged with the preparation of the different propositions to be submitted for your consideration, has followed the method of modern economy in the division of work.

To our President and to myself the Commission has entrusted the financial part of our programme.

It is the same method of division of work which now leads me to explain to you, as reporter, this part of the programme, and to present to you the ideas and motives which have guided us. It is my duty to premise that while I have been charged with reporting this part of the programme, I have not performed the greatest part of the work. It is to our venerable President, Count Faina, that we owe the propositions which I shall lay before you; they are his ideas and his propositions, the result of his unceasing labour during the past summer, which have furnished the basis of the deliberations and decisions of the Commission in all that concerns this part of the programme. It is because of his position as President that he abstains from addressing you personally upon these propositions, which are chiefly the result of his own work.

I have told you, gentlemen, that I will report upon the financial part, that is to say, upon those articles of our procedure, which, in their definite consequences, find expression in the figures of our budget, or rather which furnish the most essential elements of our budget.



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These articles refer to (1) The organic plan affecting the principle of the remuneration of our officers and the establishment of regulations governing their situation during the period of their service; (2) The system of retiring allowances, that is to say, the establishment of the guarantees which we will be disposed to accord to our officers in case of sickness, old age, death or dismissal.

Always gentlemen, in discussing these articles, we should not consider exclusively the consequences of a financial nature which they will have upon our budget, but also and perhaps in the first place, their effect upon the future of our Institute, that is to say upon the quality of our productive work, and the services which, on the foundation of our Institute, have been promised, not only to the agrarian world, but to the world as a whole.

You will find on page two of the minutes under the title 'Organic plan,' line one, the following phrase:—'The Commission adopts the following proposition; the Commission, after exchanging different points of view concerning the remuneration of officers, and of the inferior employees of the Institute, is in favour of drawing up a normal table of salaries for the different employees. This table will form the financial statute of the persons employed in the different services of the Institute and will establish upon a fixed and regular basis the pecuniary situation of the staff.'

As the different points of view have not been mentioned, I beg to draw your attention to several general observations. The organization to be established for our Institute is based—

- (1) On its financial capacity;
- (2) On its juridical nature;
- (3) On the definition of its material character;

I say nothing of the good-will of the adhering governments, who ought to furnish us the material essential for our work, as to this I have no doubt.

I dwell a moment on our financial capacity; as you know gentlemen, this is actually very limited, but fortunately, there already exists to a certain degree, the possibility of its further development. After the two first years of existence the unit of subscription can be raised to a maximum of 2,500 francs.

We were obliged to keep in view, in formulating our propositions, these two circumstances, and naturally we kept within the limits as actually drawn, but we have always borne in mind the fact that at a given moment there would be a possibility of improving the financial conditions of the Institute.

Now as to the juridical nature of our Institute, there are two points to consider:—

(a) The circumstance that our Institute does not possess in itself the absolute guarantee of unlimited duration although we all have full and entire confidence in its permanency. It follows that we cannot to-day assume any liability which will imply a supposition of the permanent existence of the Institute. On the contrary we must admit the hypothesis that at any time the Institute may cease to exist, and that, in that event, we should find ourselves entirely free from any kind of liability. In practice this is important, as in choosing a system of remuneration and in fixing the nature of the engagement of our officers, we ought to reserve the power of dismissing them at any time, and pay them accordingly.

(b) The other point has reference to the international nature of the Institute which demands a composition of the staff equally international, as is provided by article 26 of our procedure. We must then reckon with the fact that we will have to engage officers coming from different countries and give them a comfortable existence in a foreign country, and although in this case it is the beautiful country of Italy, in which we admire so many sublime things, it is none the less for them a foreign residence, subject to some privations as well as exceptional expenses. Our officers then should find certain compensation in their remuneration.

(c) I have mentioned a third cardinal point to wit, the definition of the char-



## SESSIONAL PAPER No. 15b

acter of our Institute; if you were to ask me for a positive definition of our Institute, I would find it difficult to answer you.

Permit me then to tell you now that which is not in the nature of the Institute.

Has the Institute a diplomatic character? No, gentlemen; although we have the honour and the pleasure of counting among ourselves a great number of eminent diplomats and although in the General Assembly there will be perhaps diplomatic representatives of the governments who will lead their delegations, the true character of our Institute will not change. Certainly, gentlemen, the Institute in view of its international composition, will always be in touch with diplomacy, and I would even say that the Institute by its preparatory work, will render services to diplomacy, in dealing with international matters, but the Institute can never assume a diplomatic character, without risking the failure of realizing the objects which it has in view.

Has our Institute the character of an administrative governmental institution? No, gentlemen; neither would that suit the nature of our task. Certainly we should enter and remain intimately in touch with all governmental administrations. They will be, if I may use the expression, our nurses, from whom we will draw our financial means, as well as the material which we require for our work. Meanwhile our organization and our method of work differ entirely from governmental administrative systems. A bureaucratic routine would mean the death of our Institute.

Has our Institute a purely scientific character? No, gentlemen; it is not ours to seek the solution of scientific problems, but we will be able to serve science and to assist it by bringing to it very useful scientific material. We will be closely allied to science; I would even say our methods of work will resemble scientific methods more than any other, but our Institute will not, for all that, be a scientific Institute.

Has our Institute the character of a statistical bureau? Does it resemble a government statistical office? No, gentlemen; it will certainly have much affinity with such an office, but its character will be very different. Certainly, gentlemen, the statistical offices will be our principal co-workers, as on the other hand, our Institute by elaboration of material collected in all parts of the world will be able to materially aid statistical bureaux. But there will nevertheless exist a great difference. This difference arises, from the fact that our Institute is not called upon to deal with dead but with living statistics. I do not say that the existing statistical bureaux do not also deal with living statistics; they do, and it is precisely that part of their work by which our Institute will profit. But these living statistics are not the principal object of these bureaux. Their principal object consists, if I may say so, in the gathering and elaboration of data from a historical and retrospective point of view, which are doubtless of use in their application to existing conditions, but which are no longer existing at the time of their application. Our Institute, on the contrary, should work in such a manner as to furnish data from day to day, and consequently answer to existing and daily demands.

There, gentlemen, is a list of negations; one might reasonably ask, what then is the positive character of the Institute? In answering this question I would use a metaphor. I believe we might compare our Institute to an industry which sets out to create a principal product, but which in the course of manufacture, creates at the same time a number of secondary products. In the Institute the first matter would be the assembling of information coming to us from governments and from other sources throughout the entire world. The principal product which we desire to create is a certain and wide basis for the formation of real prices of agricultural products. The secondary products are more varied: they consist of the services which we can render to agricultural and commercial statistics in general, to science, to government administration and to diplomacy.

The Institute will then have the character of an industrial scientific establishment of such a sort that its organization, its methods of work, its staff and the qualifications of its employees will correspond with its special character.



1 GEORGE V., A. 1911

I have had to extend my remarks somewhat to arrive at a very simple conclusion, namely, that we should have a staff having qualifications entirely special, of extensive culture and worthy of the greatest confidence. Needless to say, I speak specially of the directing officers, from whom we will require exceptional qualifications, but, inasmuch as on the one hand we are obliged to engage such officers, we wish on the other hand, as I have already had occasion to explain, to reserve to ourselves every possible liberty of action.

It must be added that this reservation is the much more necessary because of the novelty of the enterprise and our lack of experience which must eventually confine us to the nomination of persons whom we will be able to dismiss at any time.

It follows that it will be only at a very high rate of remuneration that we will be able to find superior officers entirely suited to our needs.

These are, gentlemen, the points of view which have guided us in establishing the normal table of appointments for all the officers, particularly for those who will hold controlling positions and those to whom the international principle is particularly applicable.

For those employees to whom these considerations do not apply, we have been able to conform approximately to the scale of payment in force in Italy, bearing in mind at the same time, that we must also demand from this portion of the staff an effective service while reserving, even towards them, every liberty of action. This is why this class of employees is equally well remunerated.'

The remainder of Dr. Mueller's address which dealt in detail with the proposed salaries, has since lost some of its value because of changes in the figures made by the Permanent Committee after the meeting of the General Assembly.

All the discussion at this and the following meeting of the Permanent Committee was confined almost entirely to matters of detail.

The special reports presented by M. Louis Dop and Dr. Mueller to the General Assembly of which you were at the time the presiding officer, contain in all necessary amplitude the results of the labours of the Permanent Committee.

These labours, so far as I was concerned, came to a close on the evening of November 18, when the two gentlemen above named were appointed as official reporters to the General Assembly.

Hon. Arthur Boyer, who, at this time, succeeded me as Canadian delegate to the Permanent Committee has doubtless informed you fully regarding the work subsequently performed by that body.

I cannot close this report without again expressing my deep sense of obligation to Sir Thomas Elliott, the official delegate of Great Britain and Ireland. To his untiring efforts, marked at all times as they were, by consideration for others, suavity and sound common sense, the Institute, in my opinion, owes almost entirely the comparative success which it has so far achieved.

I am satisfied that without his influence the task of harmonizing the views of the delegates representing the greater European powers would have been almost, if not altogether, impossible.

He was well sustained by another very able and experienced man, Sir Edward Buck, an old Indian administrator, who was for many years Secretary to the Council of India, and who has given practically his whole life to the task of organizing the agriculture of that country.

Much credit is also due to Mr. T. P. Gill, Secretary of the Department of Agriculture and Technical Instruction in Ireland, who took a deep interest in the work of the Institute and contributed largely to the measure of success achieved.

Among the delegates from other countries were many able and even brilliant men, among whom may be especially mentioned Dr. Mueller, M. Louis Dop, M. Miklos de Miklosvar, and His Excellency Boghos Pascha Nubar, the representatives respectively of Germany, France, Hungary and Egypt.



## SESSIONAL PAPER No. 15b

As the first official delegate from Canada to the International Institute of Agriculture, I desire to place on record my opinion that if the destinies of that Institute are controlled, as they ought to be, by the business nations, it is certain to have a marked influence upon the future peace and prosperity of the world.

It therefore goes without saying that the commercial nations of the world, especially those which, like Canada, are large producers of agricultural staples, should take seriously to heart their share in its development, and should employ in connection with it, the best and brainiest men available for the work.

I have the honour to be,

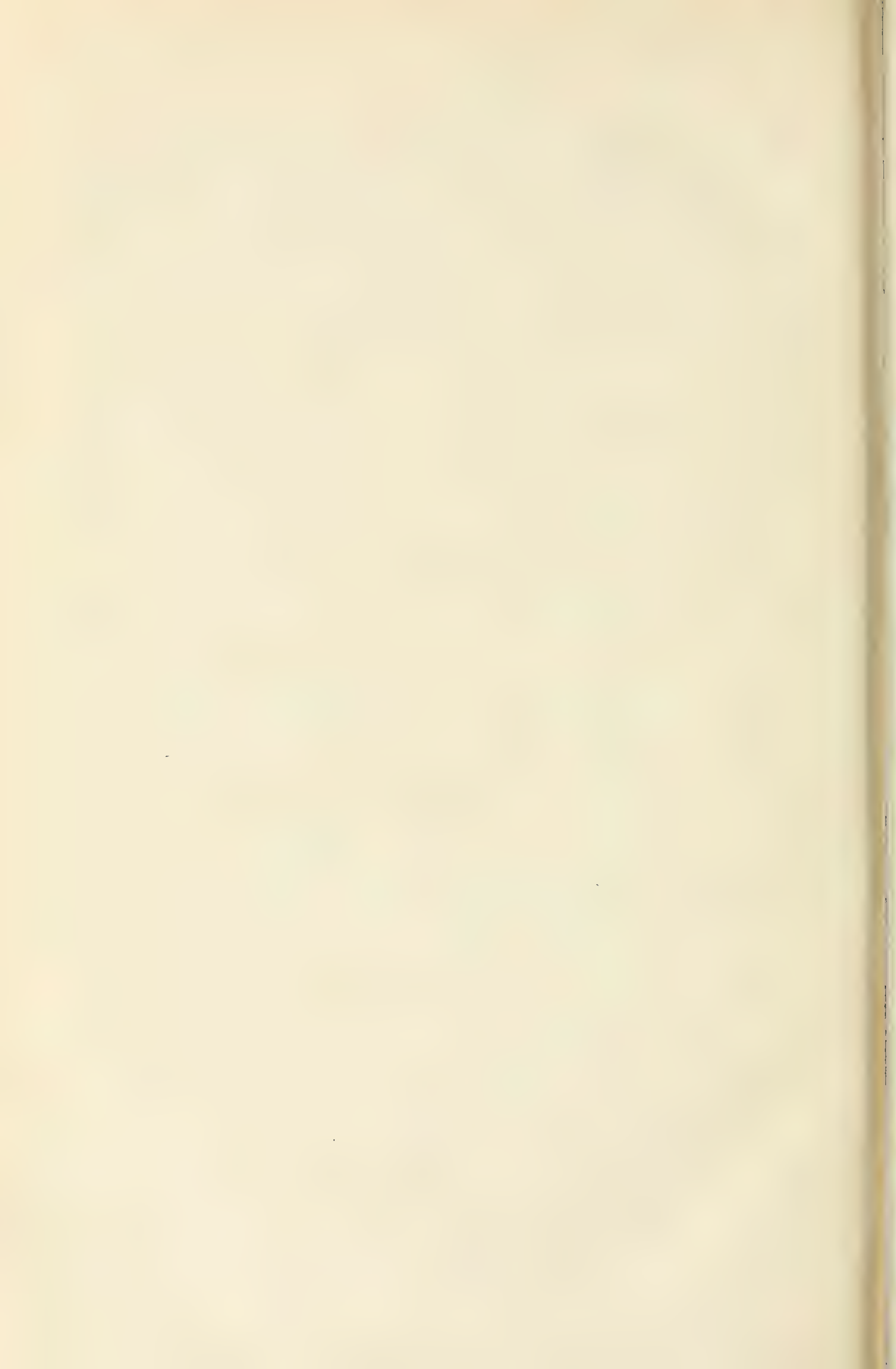
Sir,

Your obedient servant

J. G. RUTHERFORD,  
*Veterinary Director General and  
Live Stock Commissioner.*

To the Honourable,  
The Minister of Agriculture,  
Ottawa, Ont.







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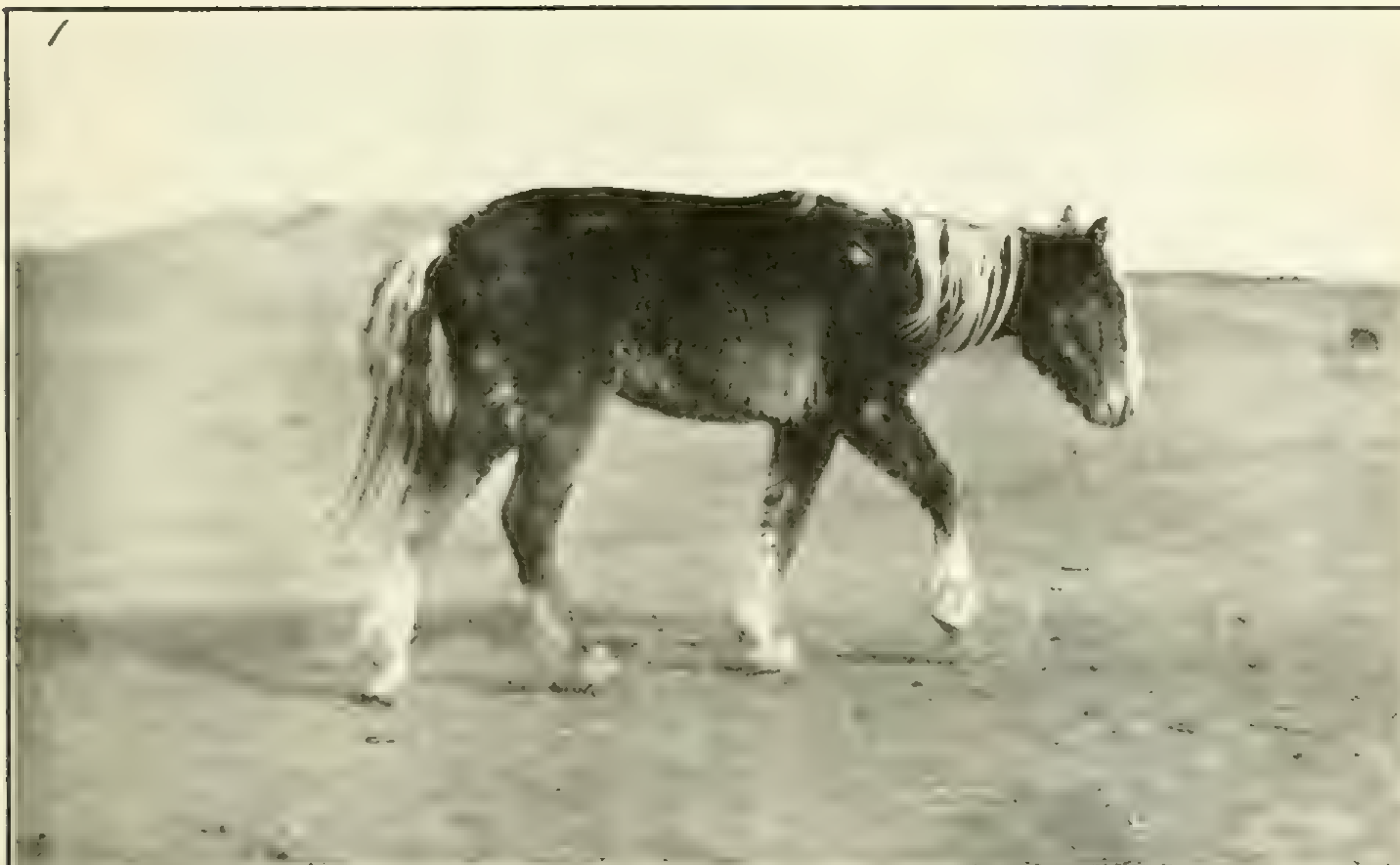
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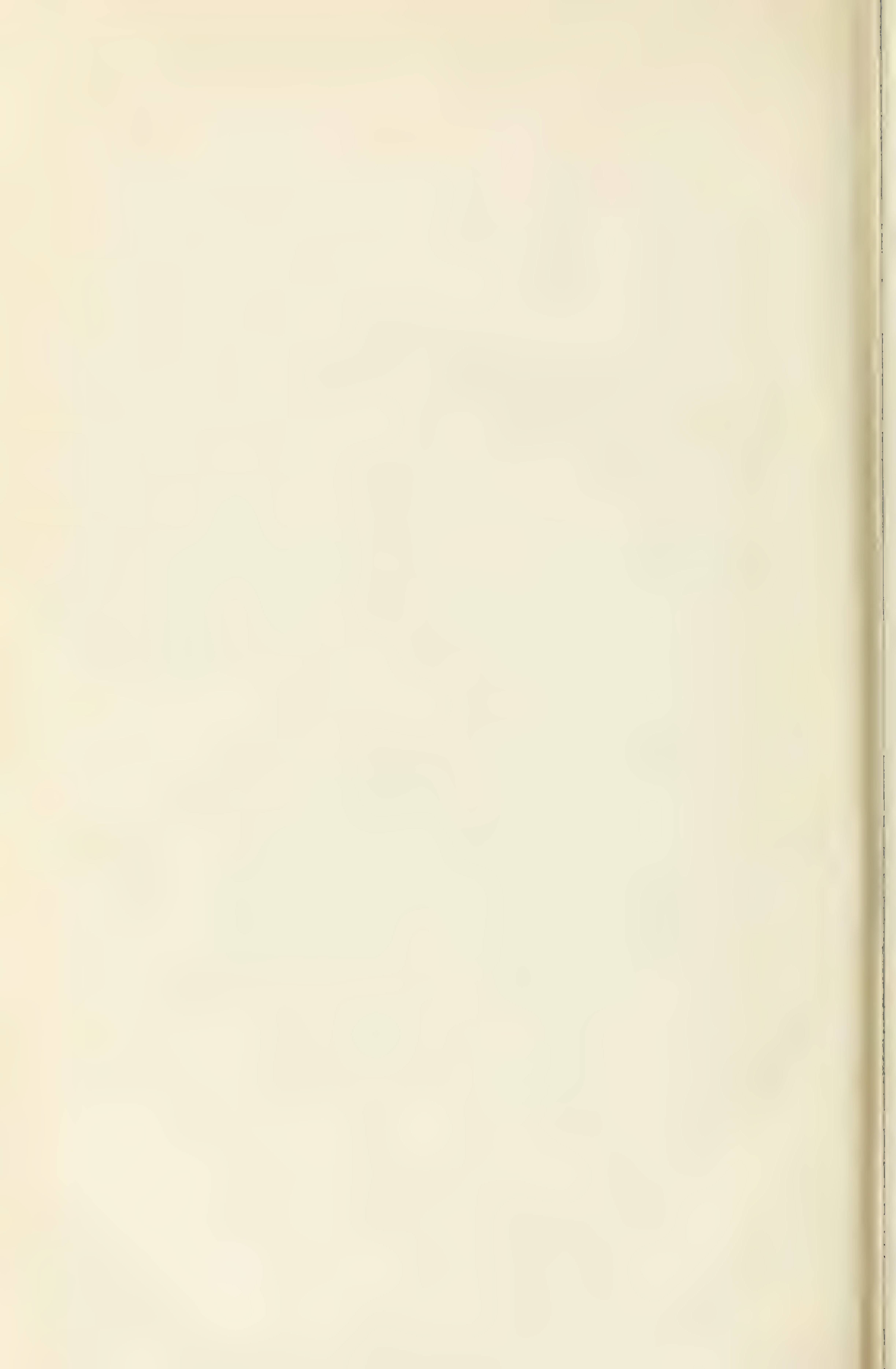
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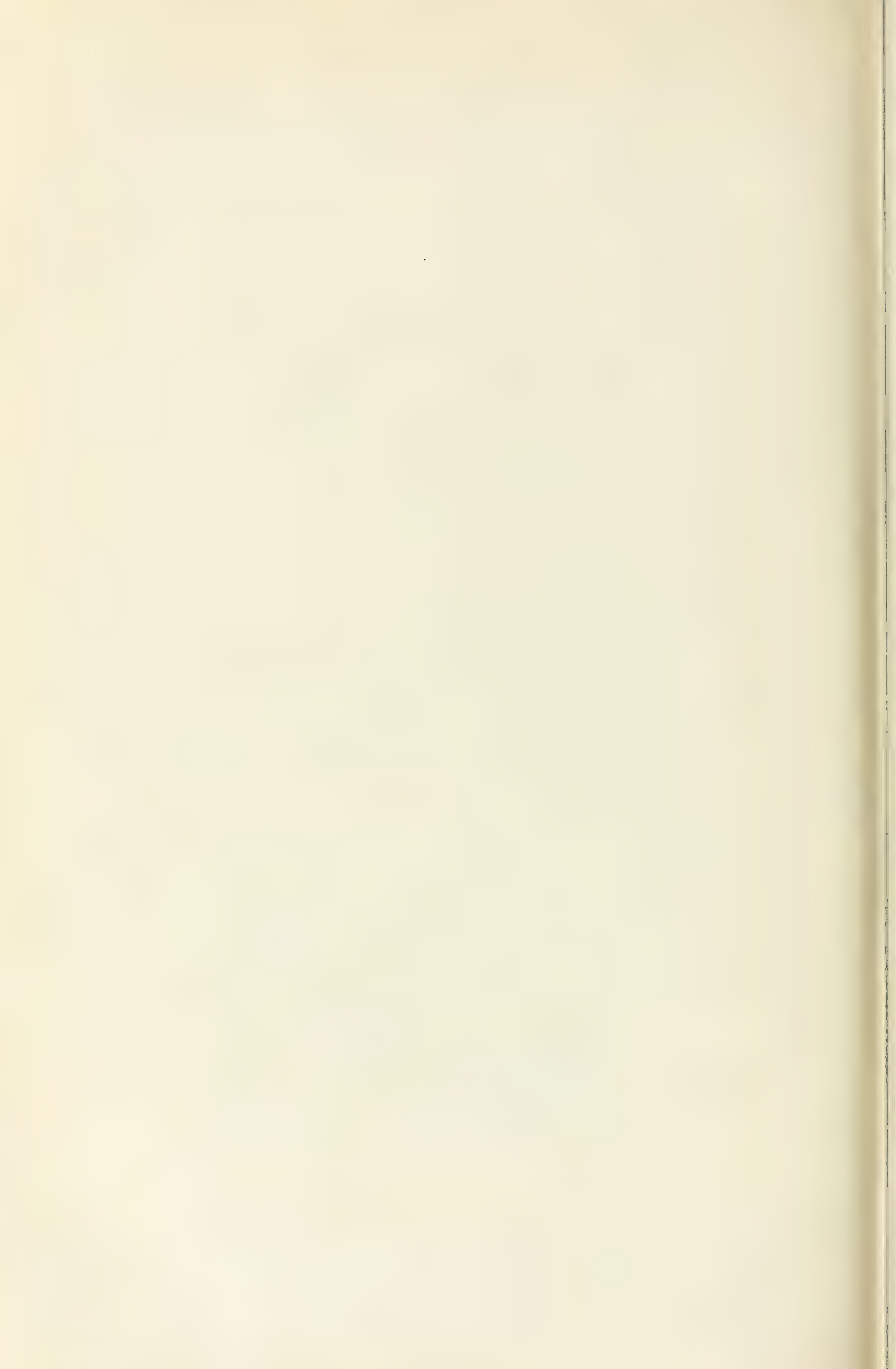




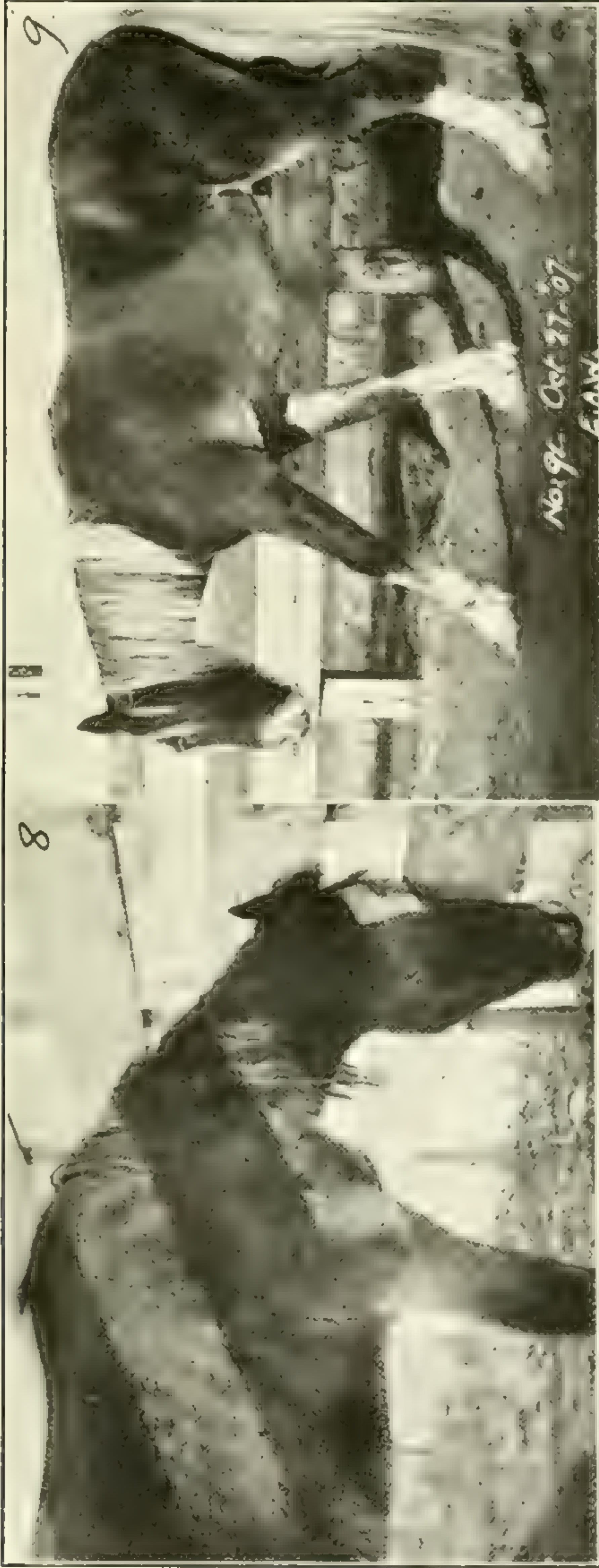


Loco Disease. (Appendix No. 10.)









Loco Disease. (Appendix No. 10.)







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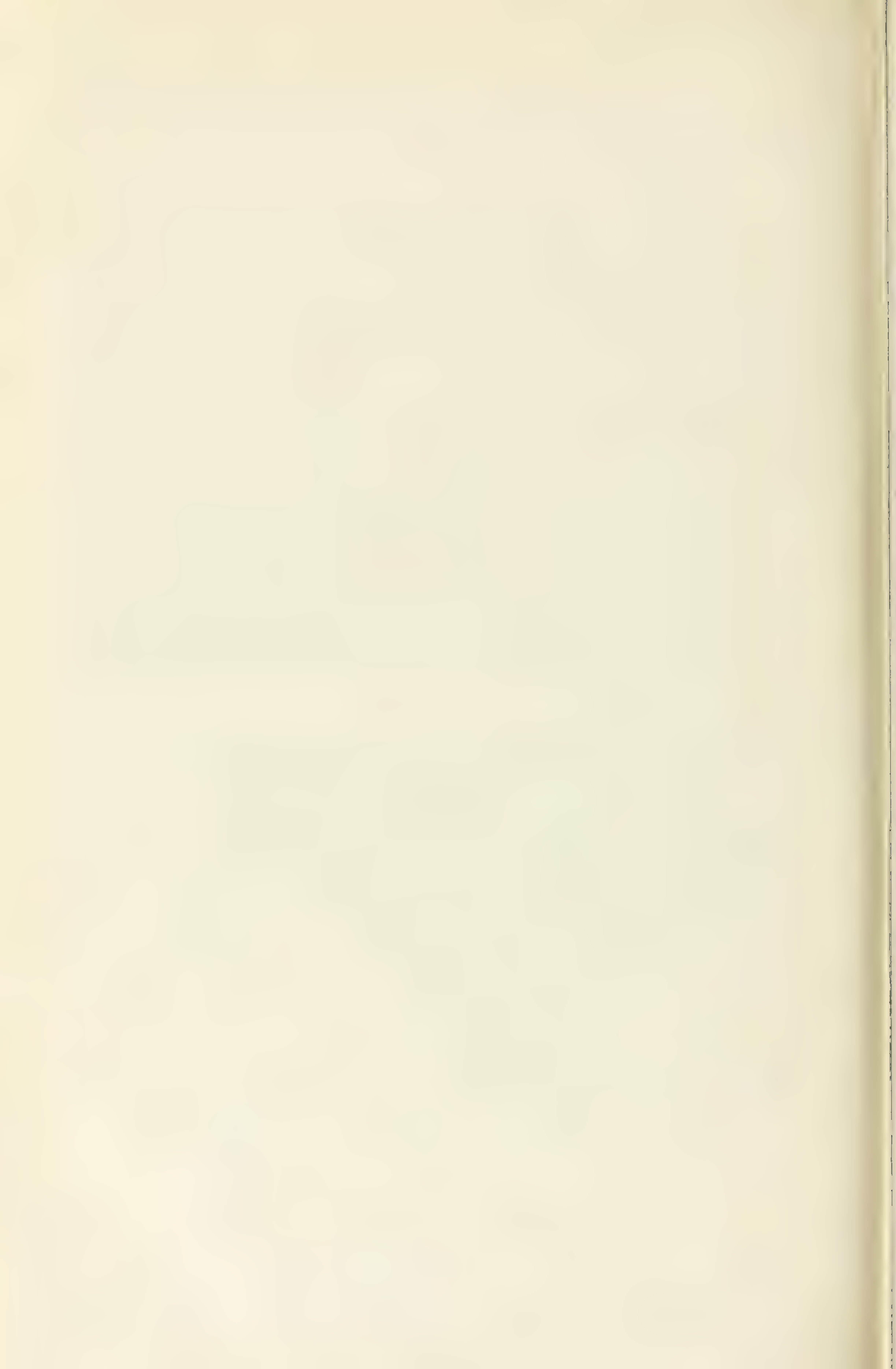


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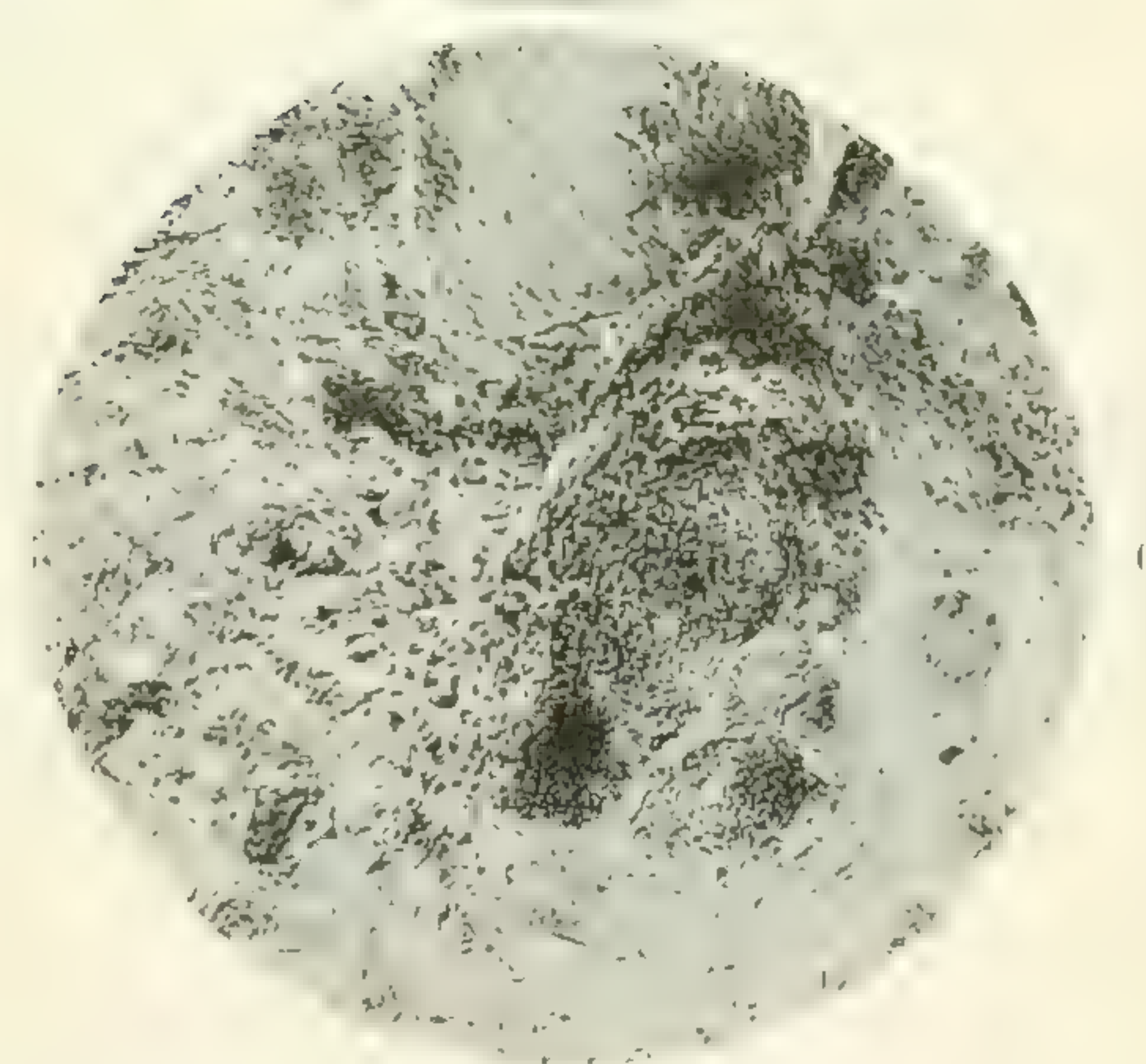
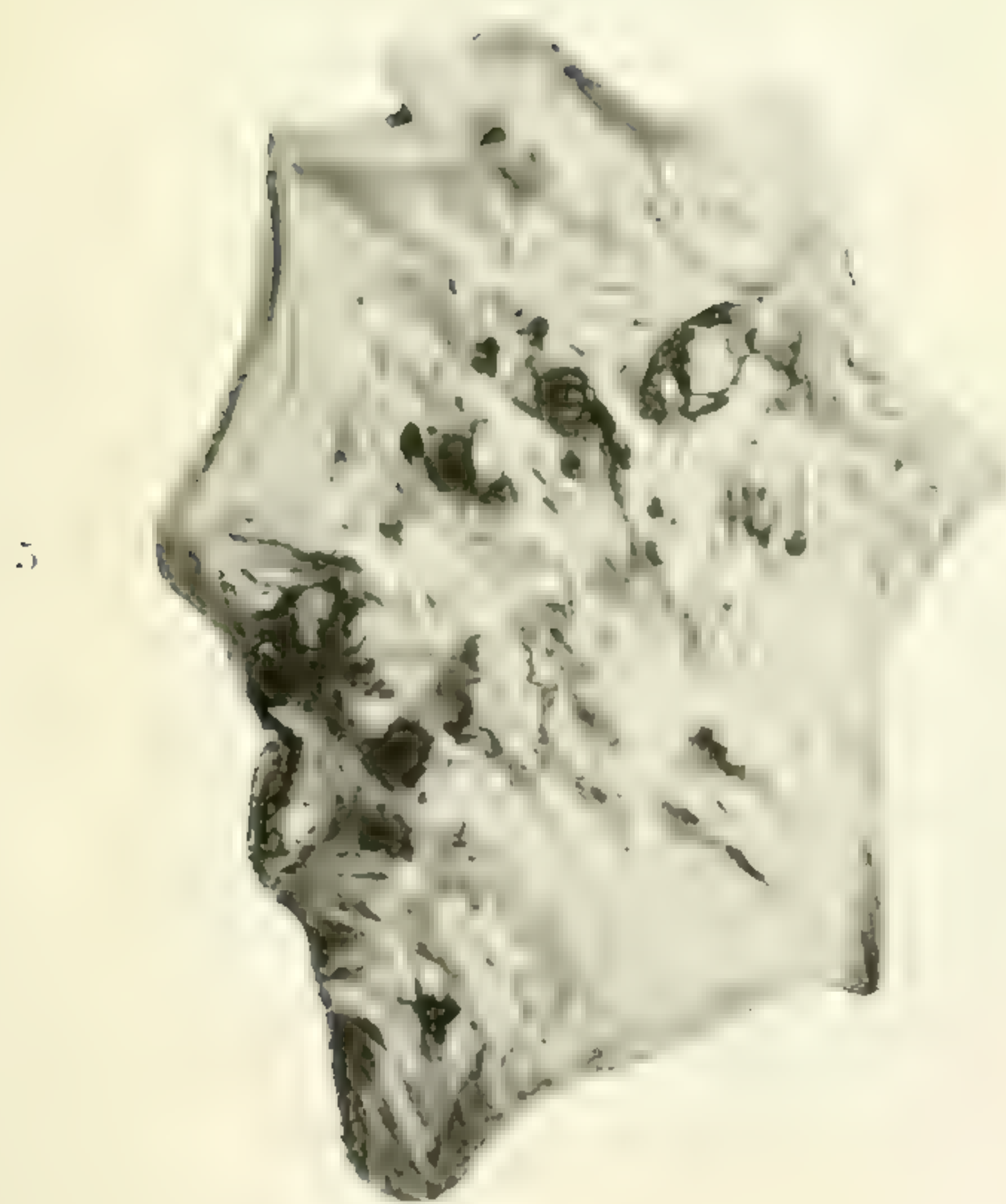
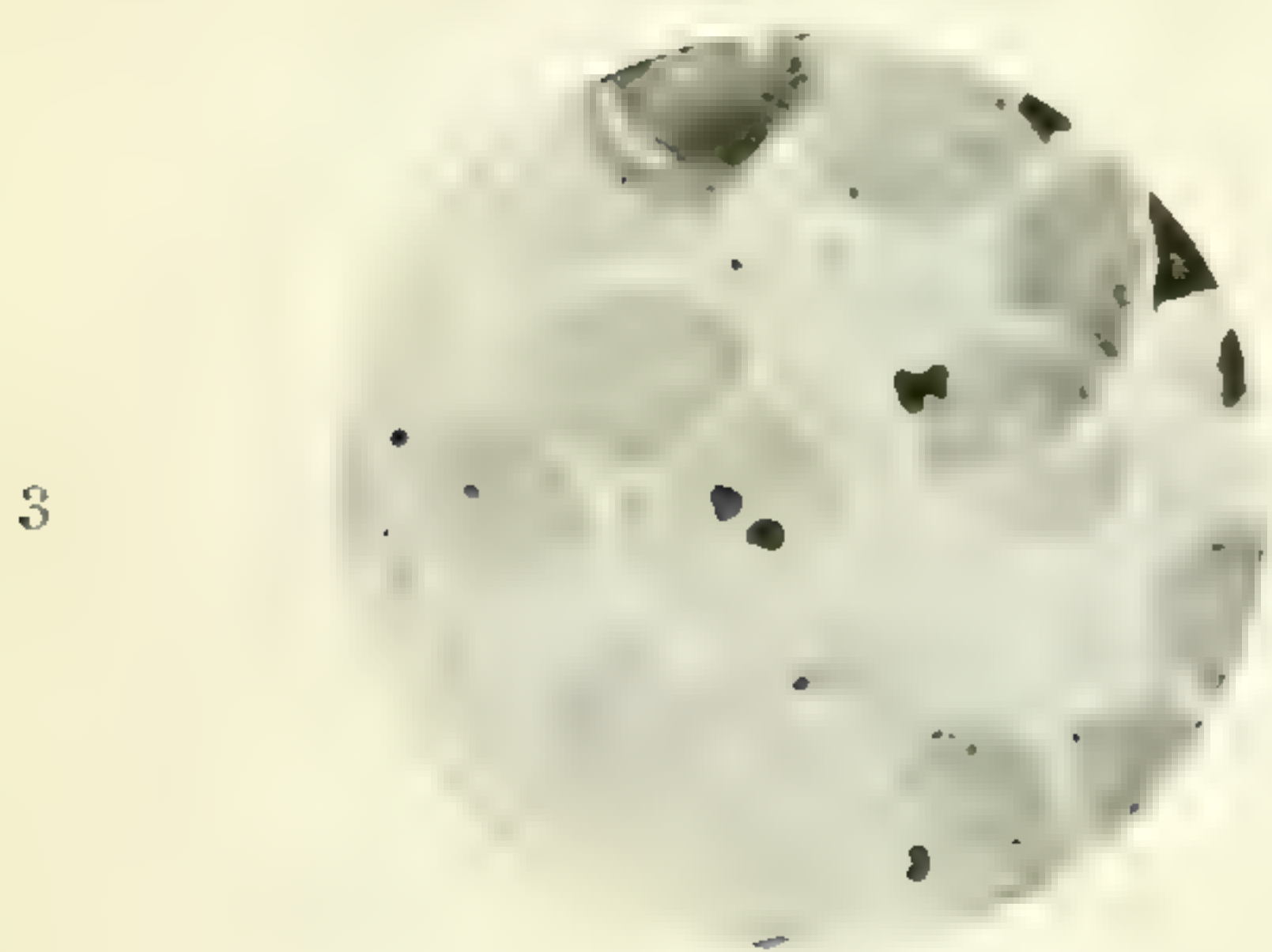


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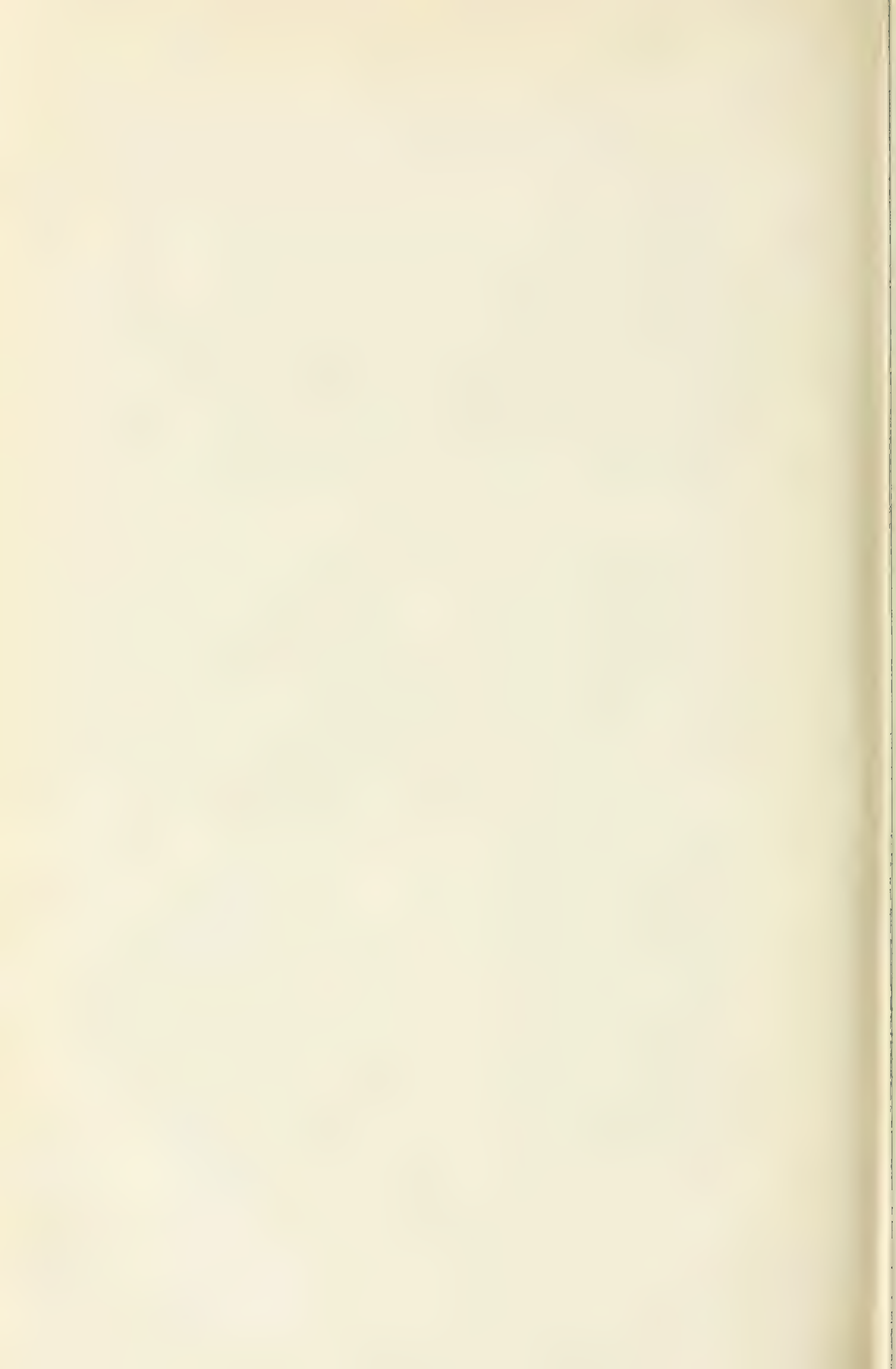




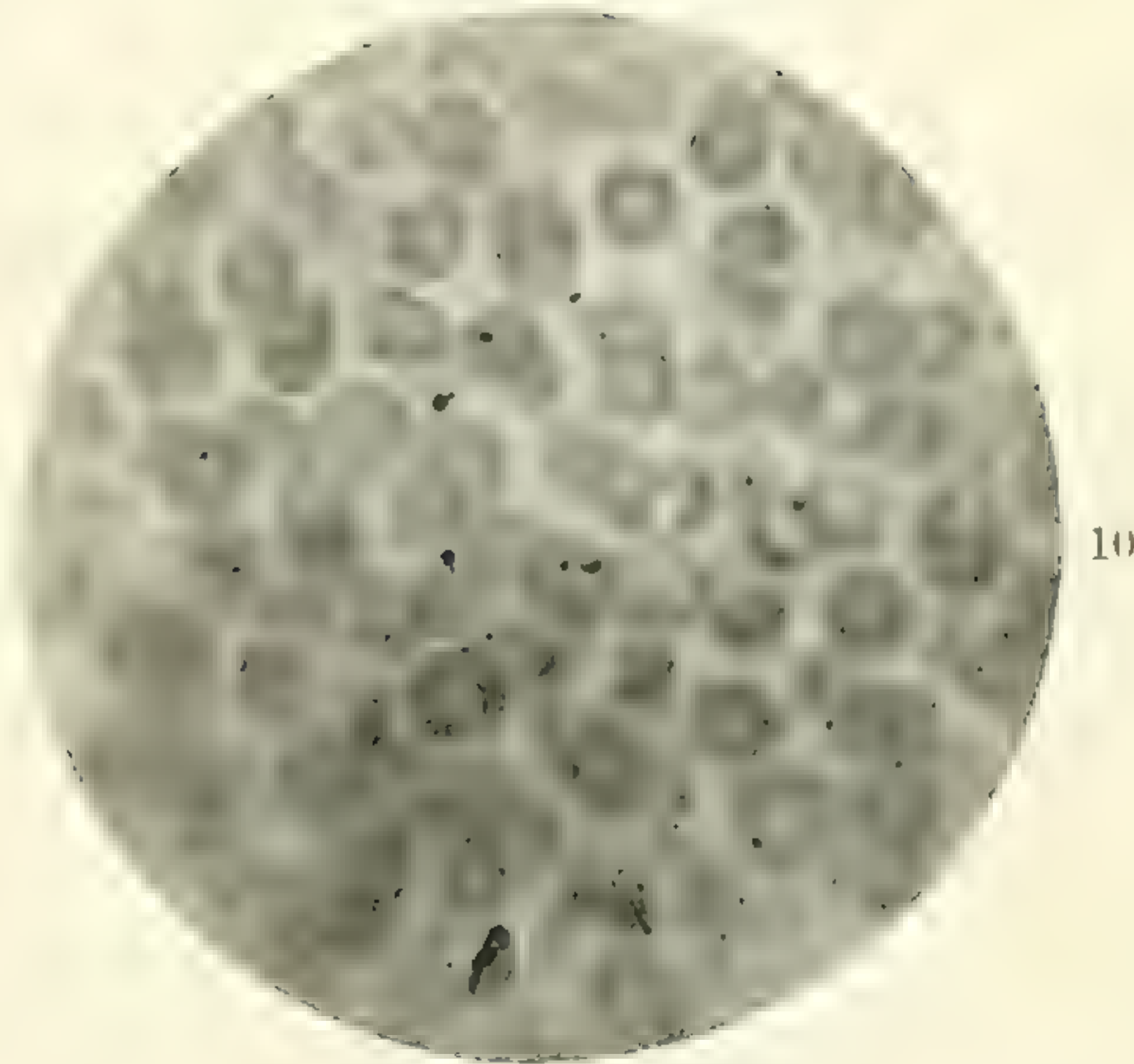
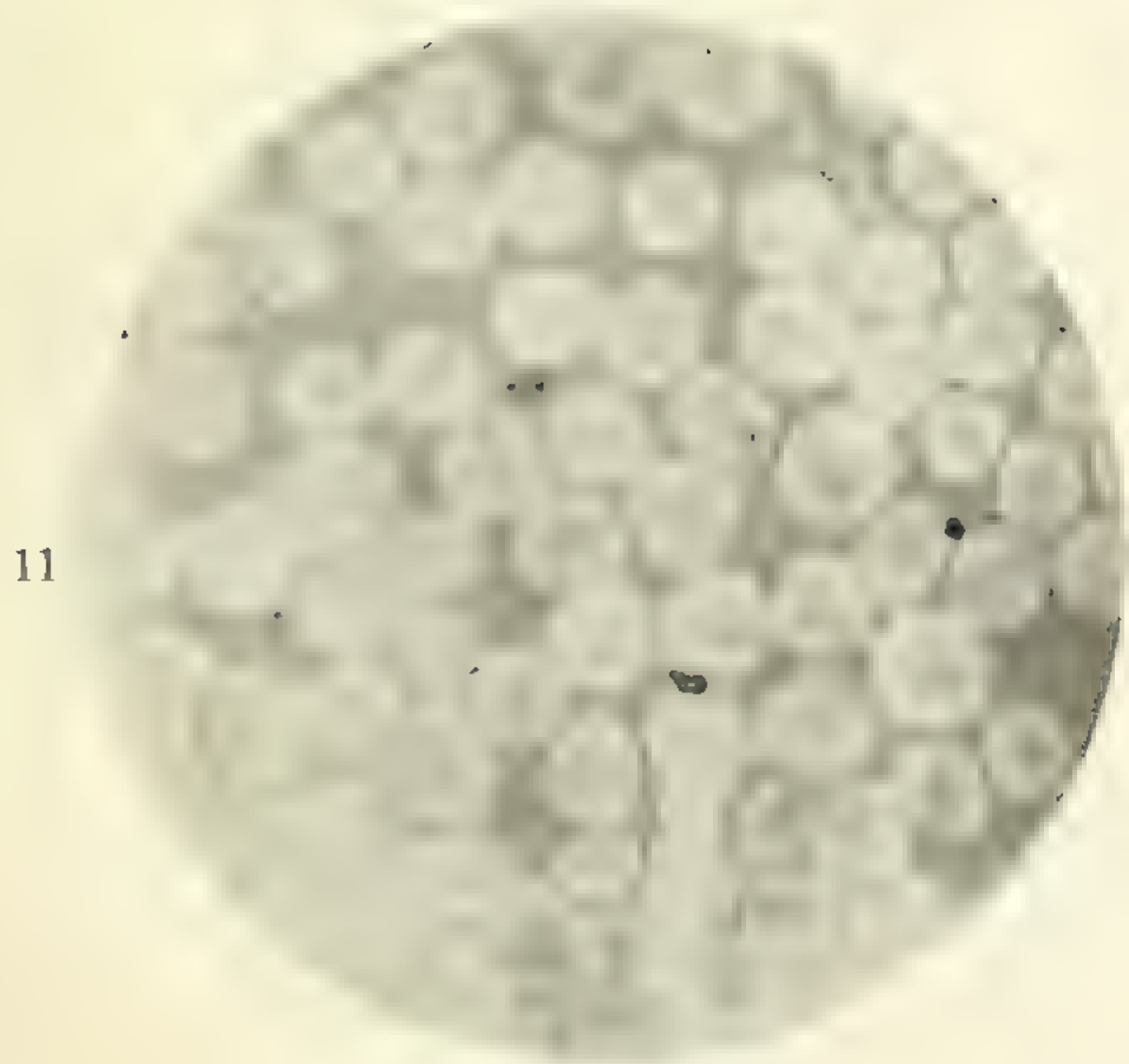
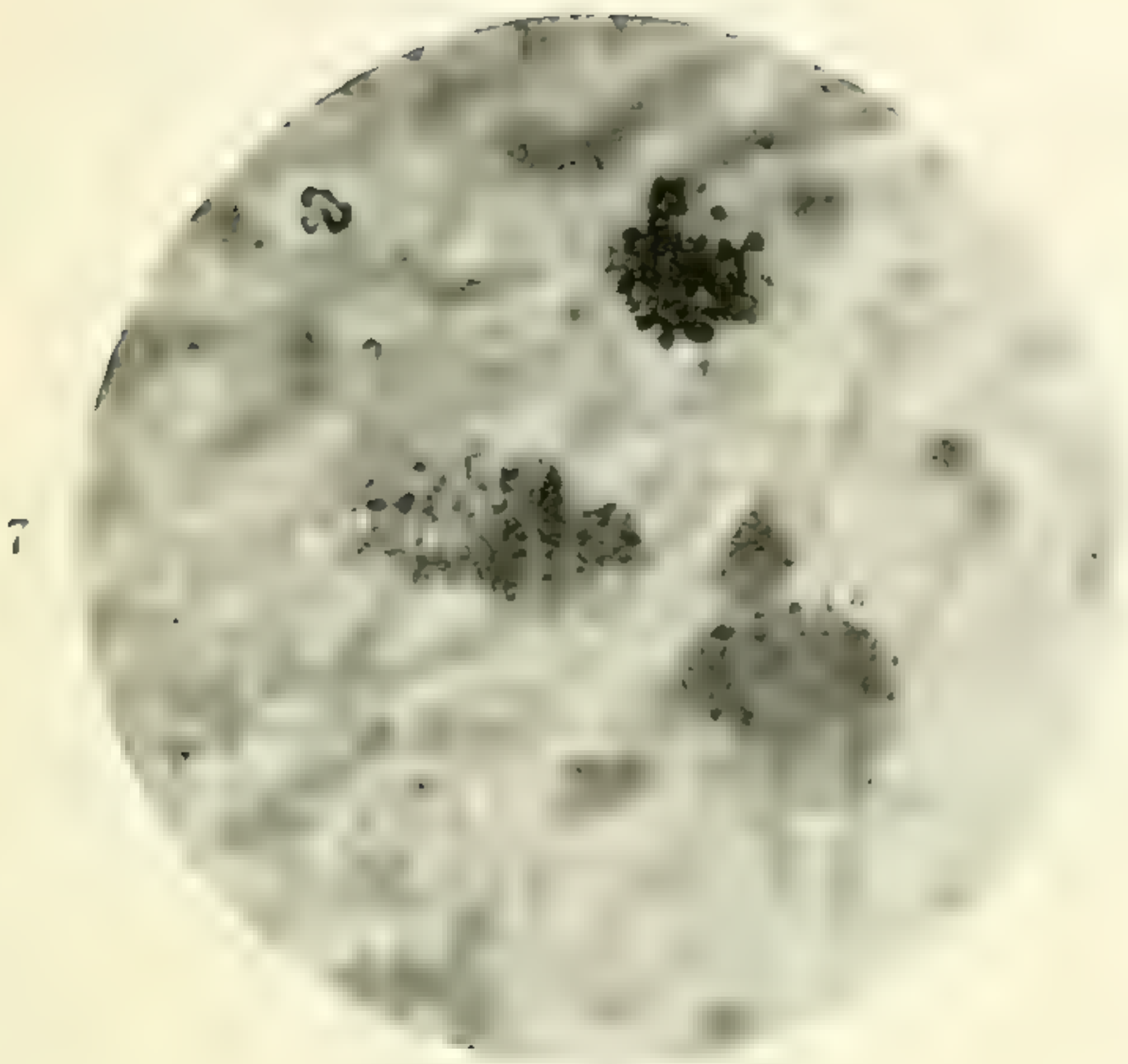


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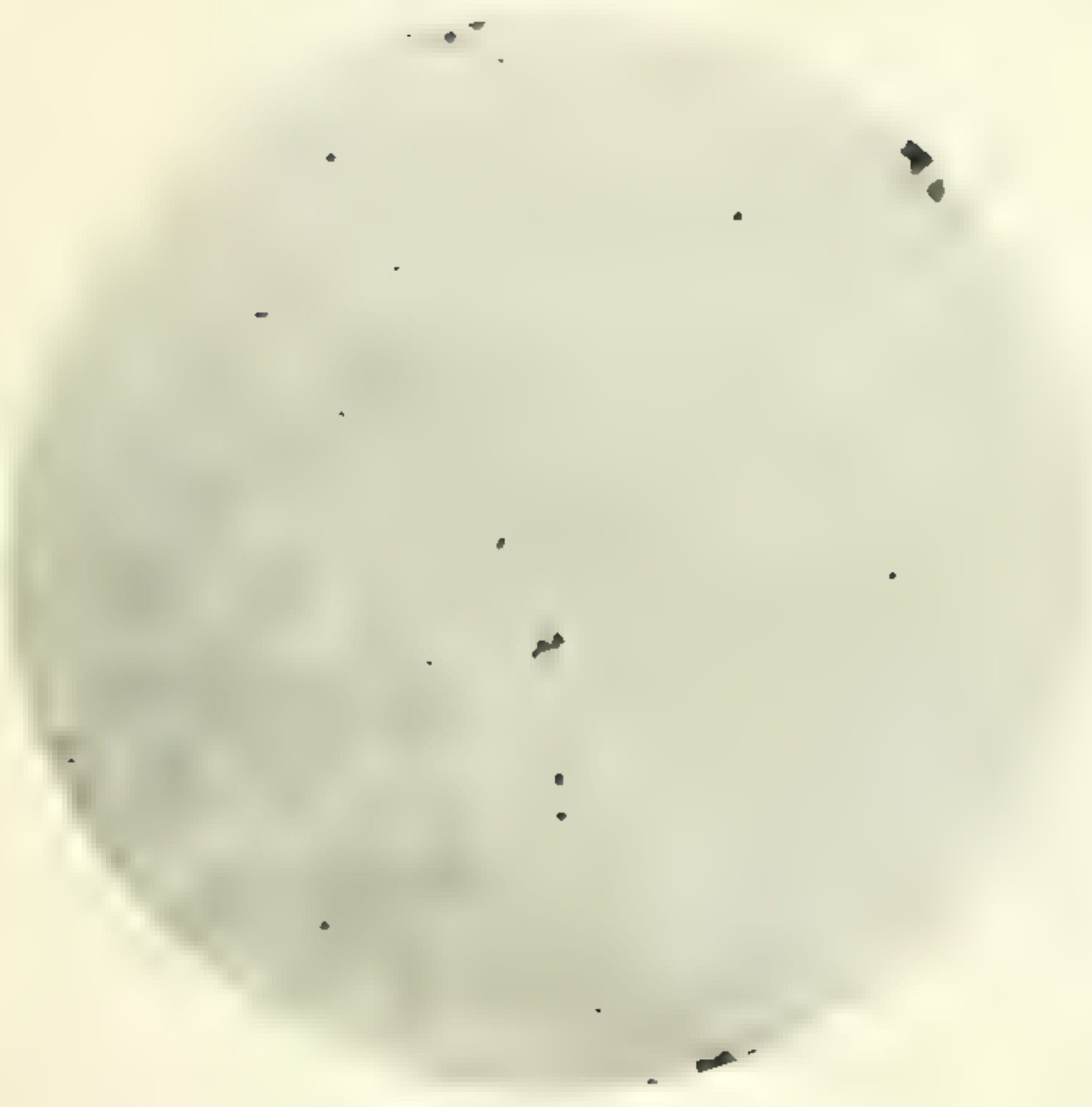
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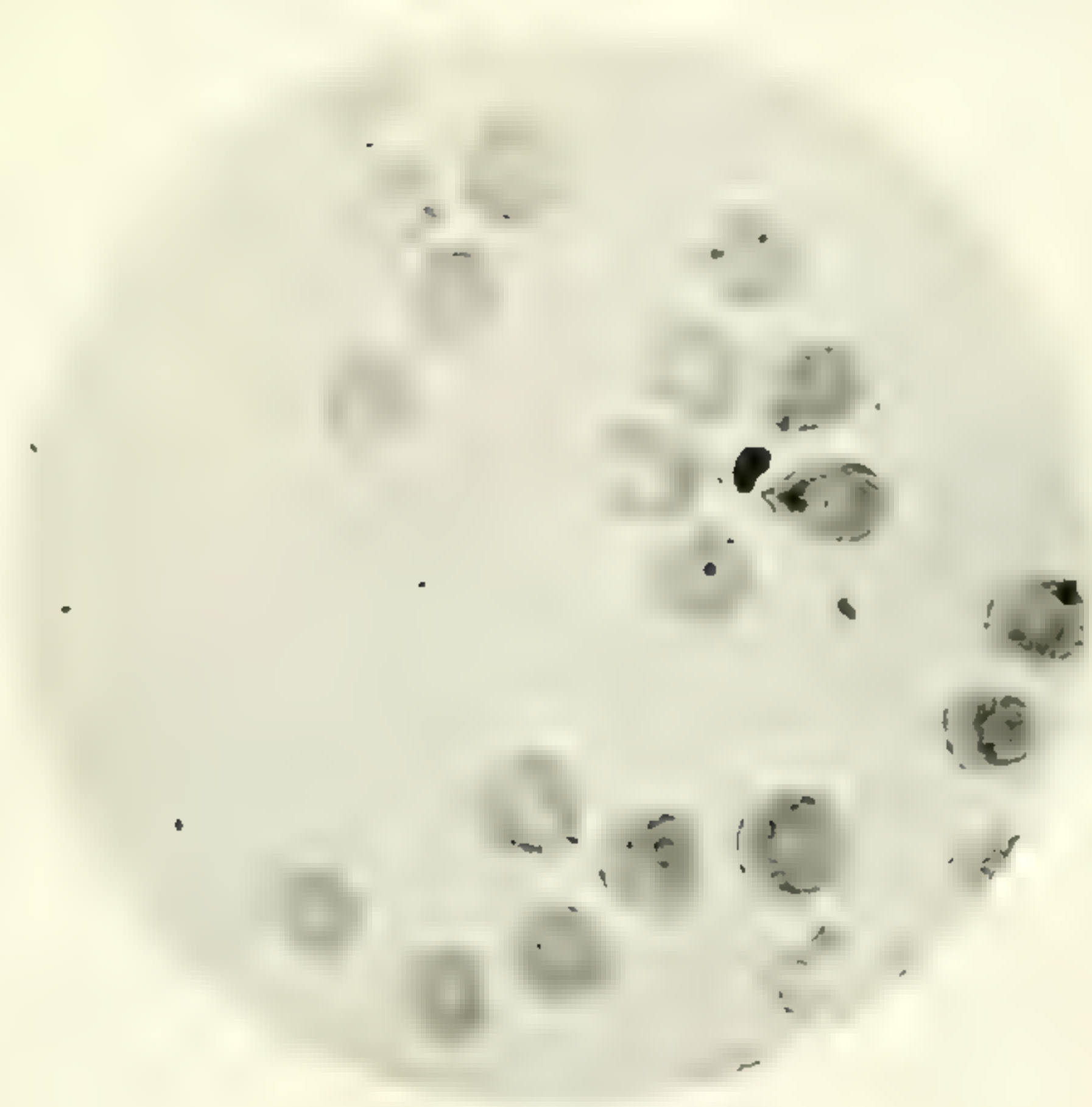
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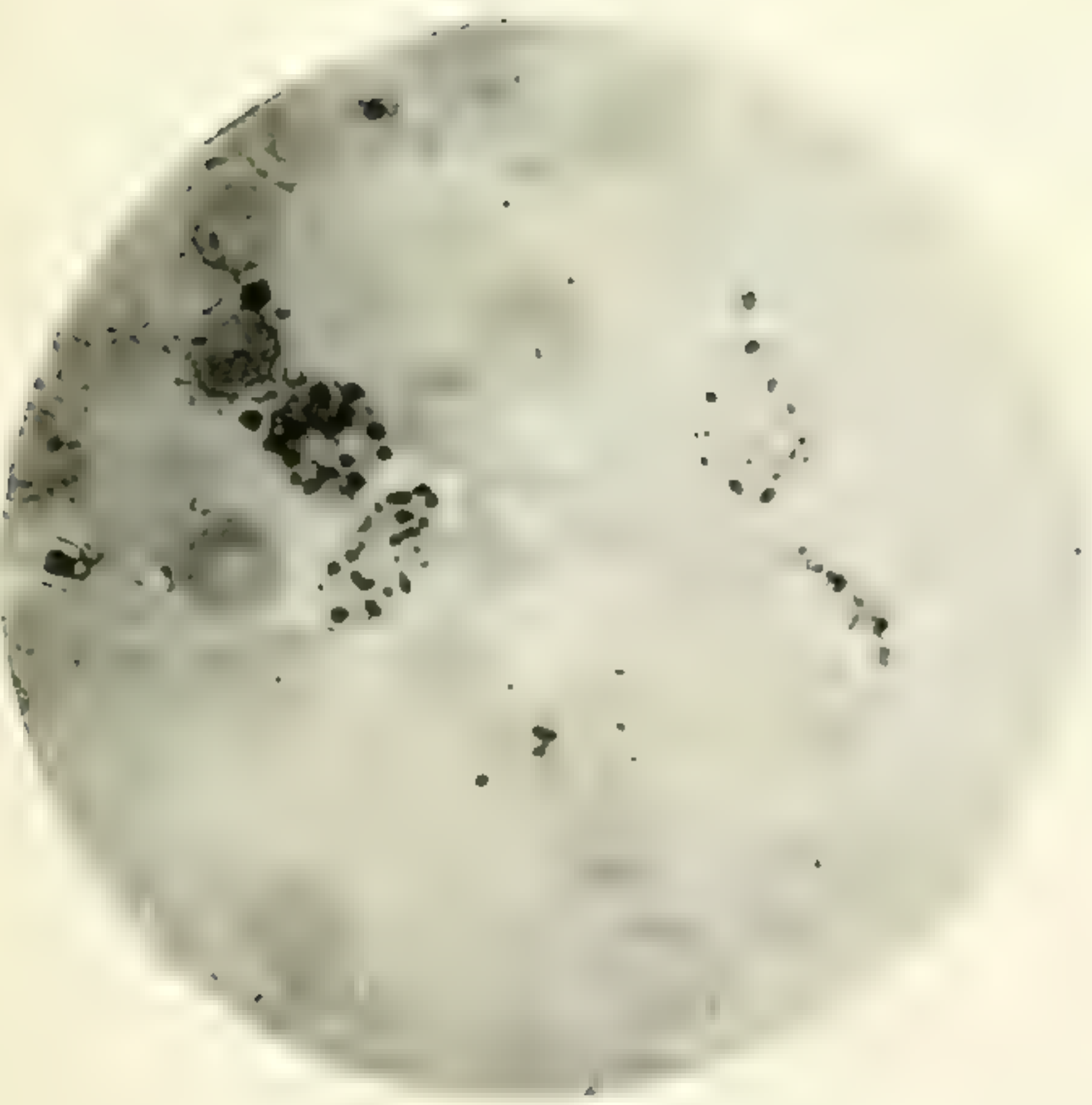
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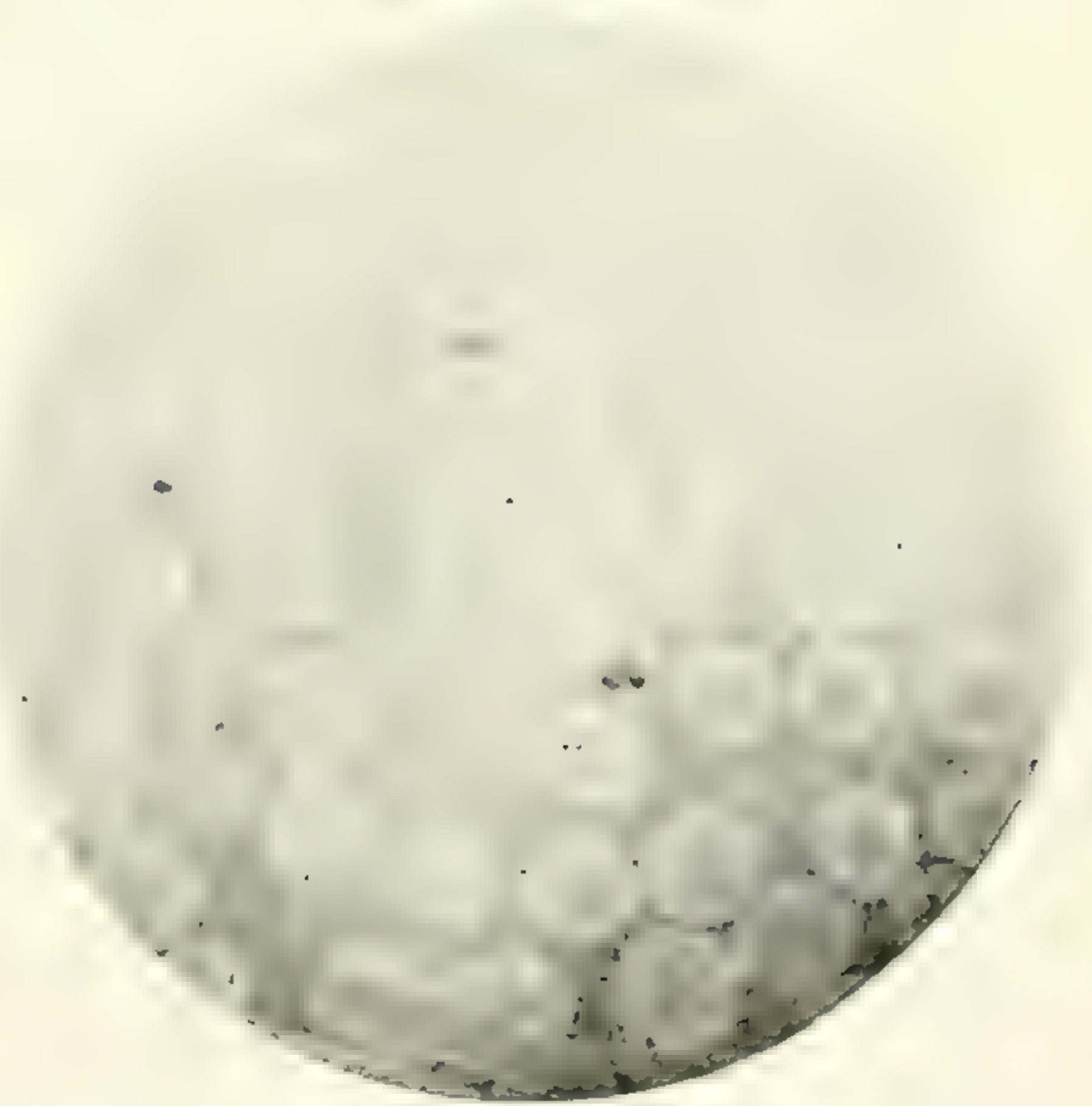
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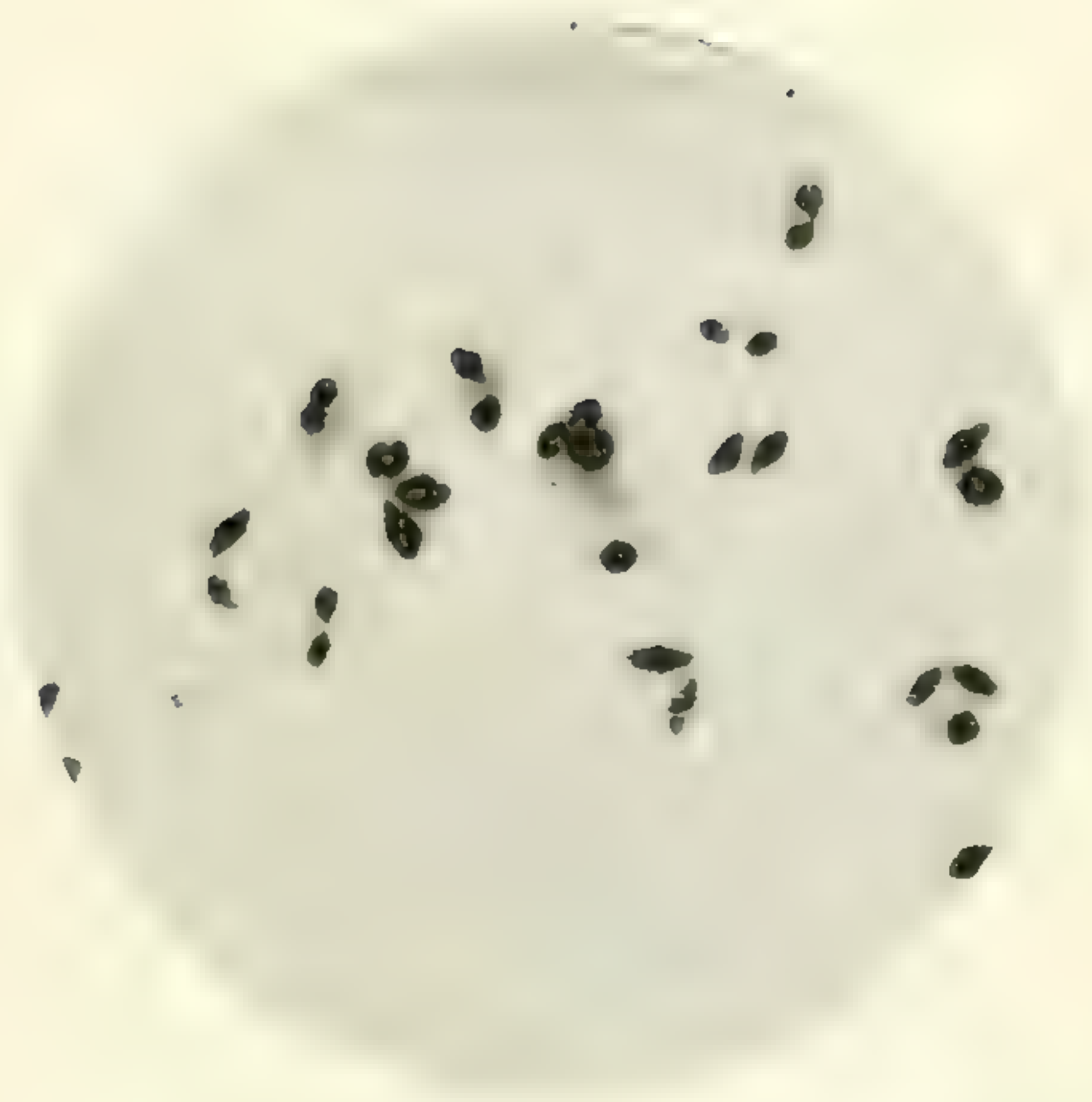




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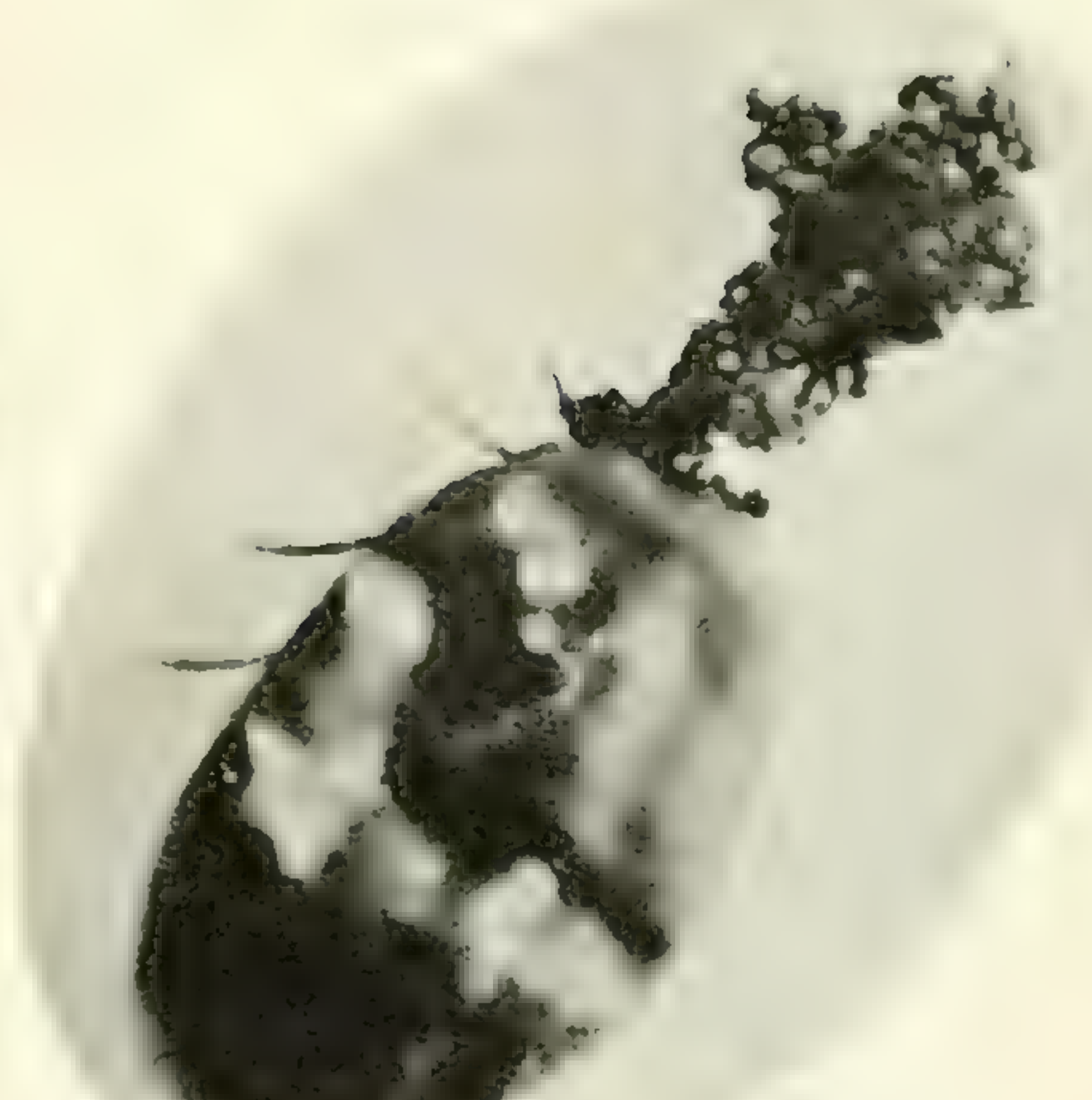
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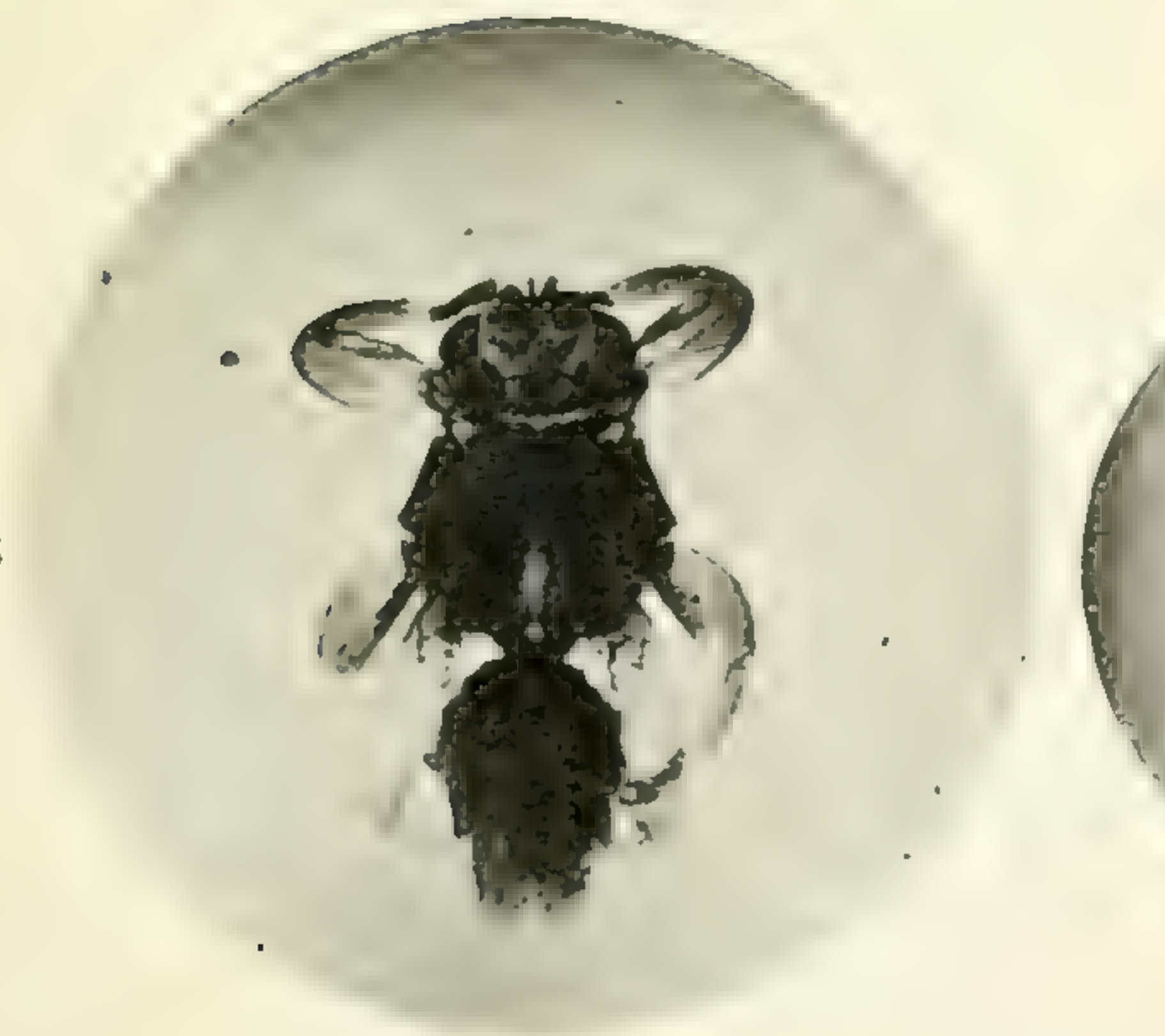
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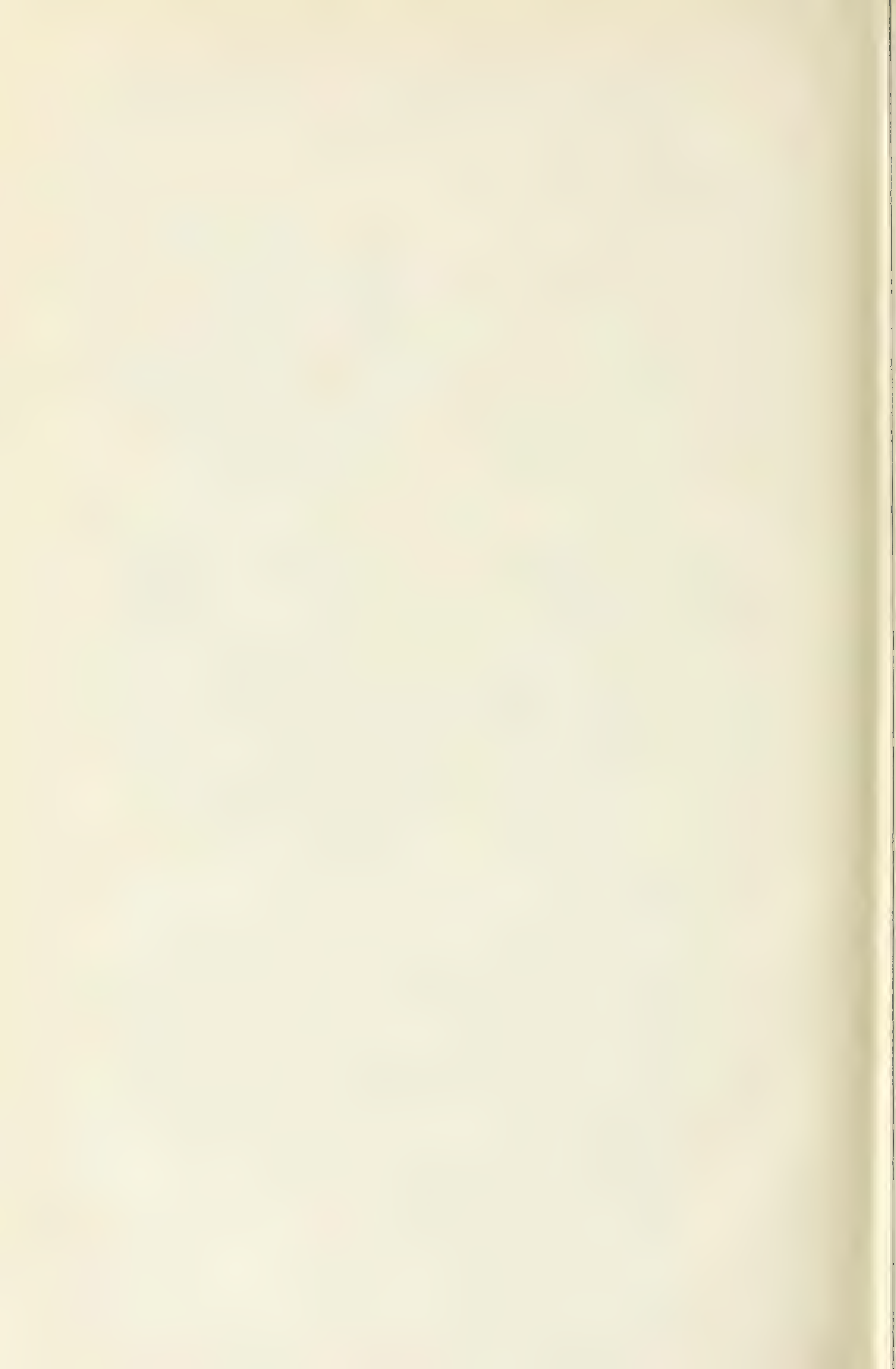


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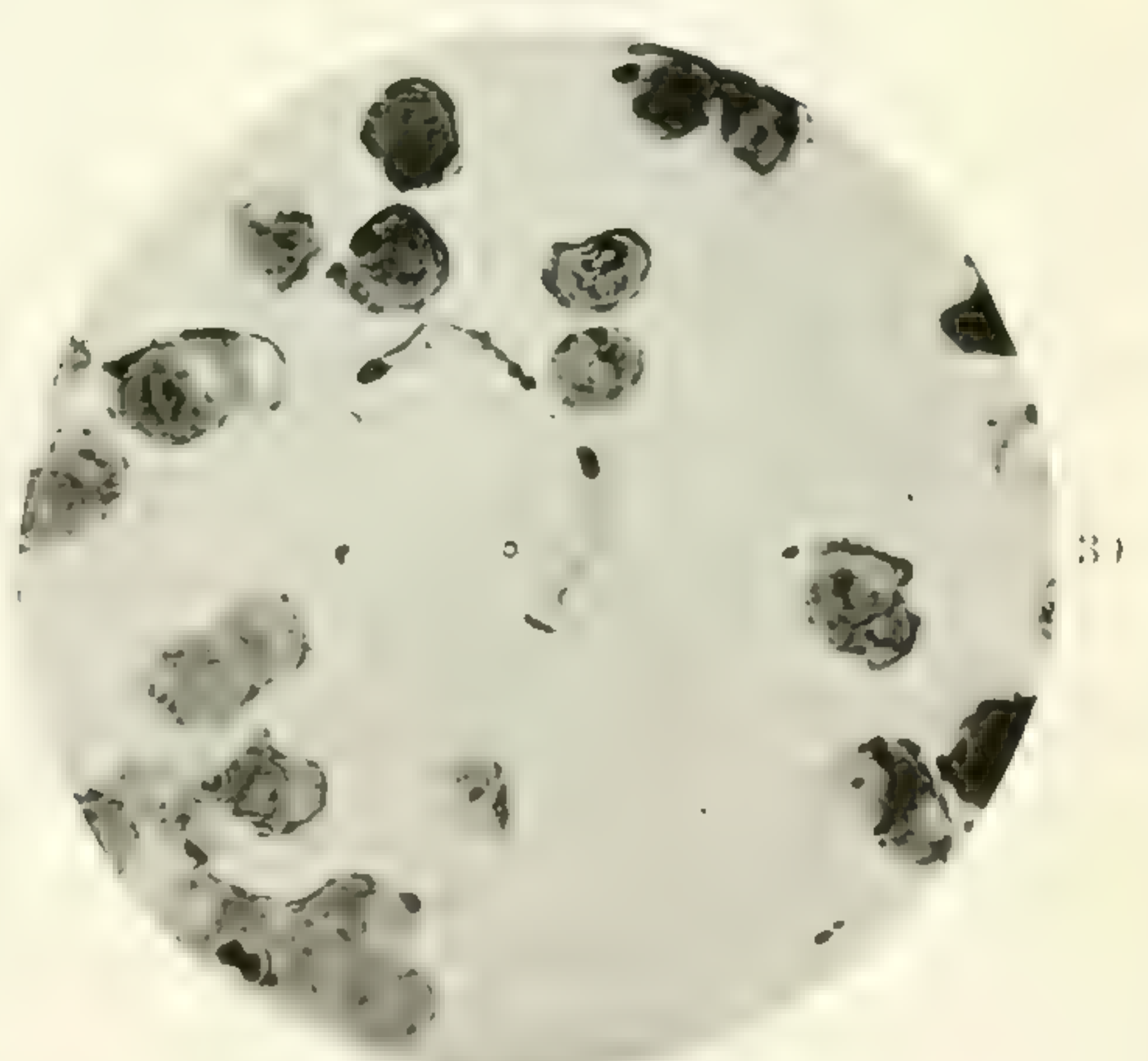
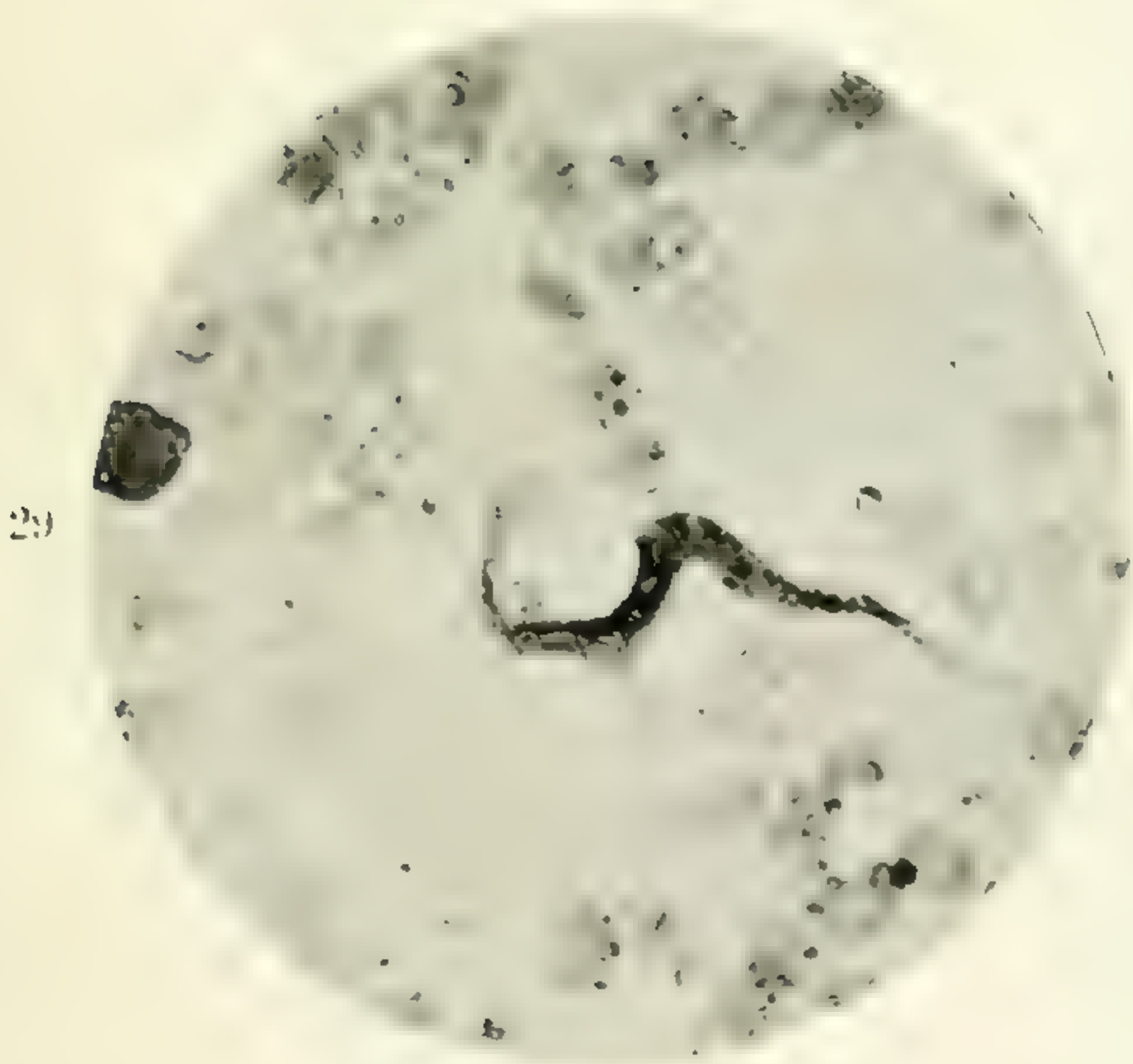
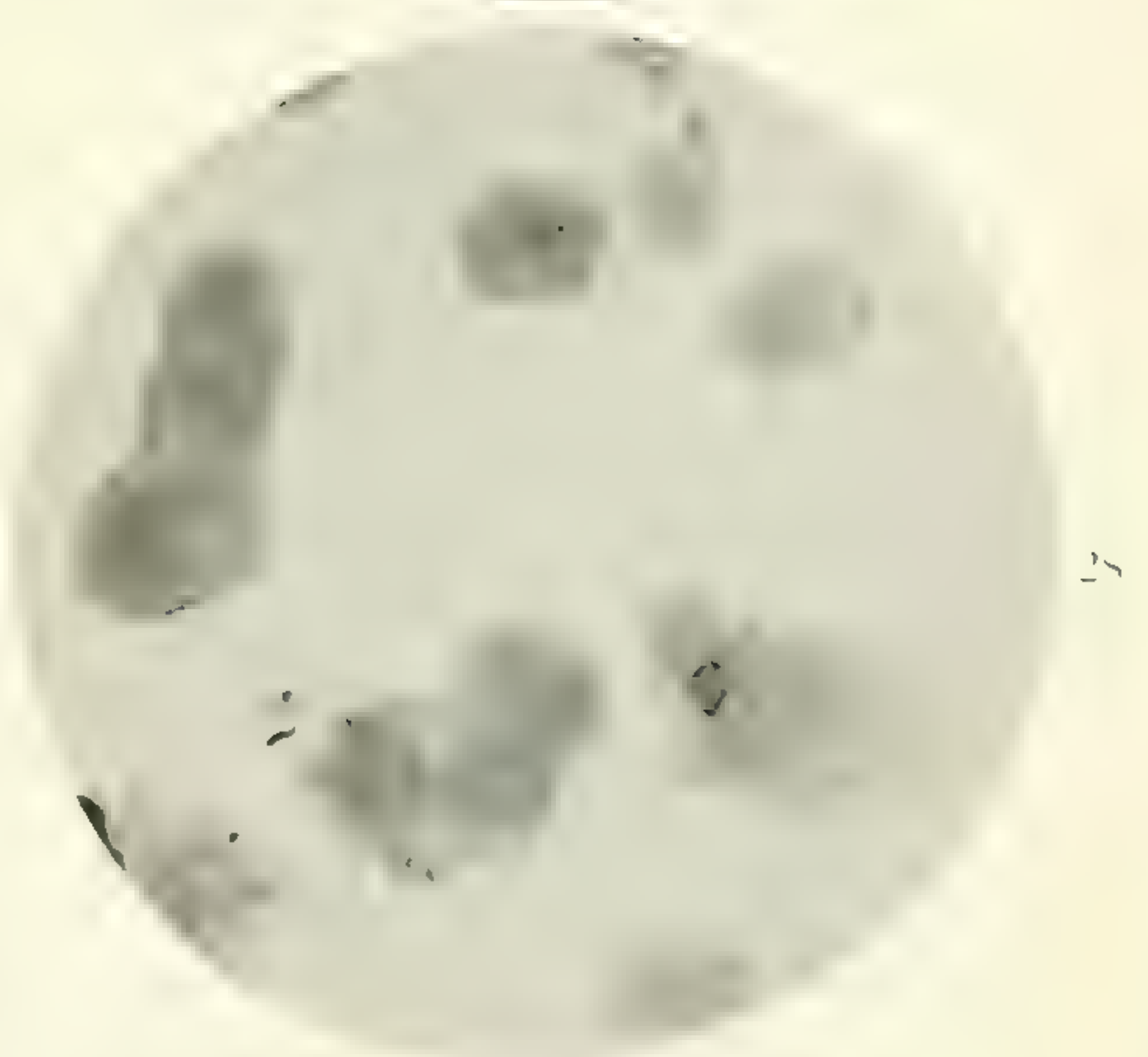
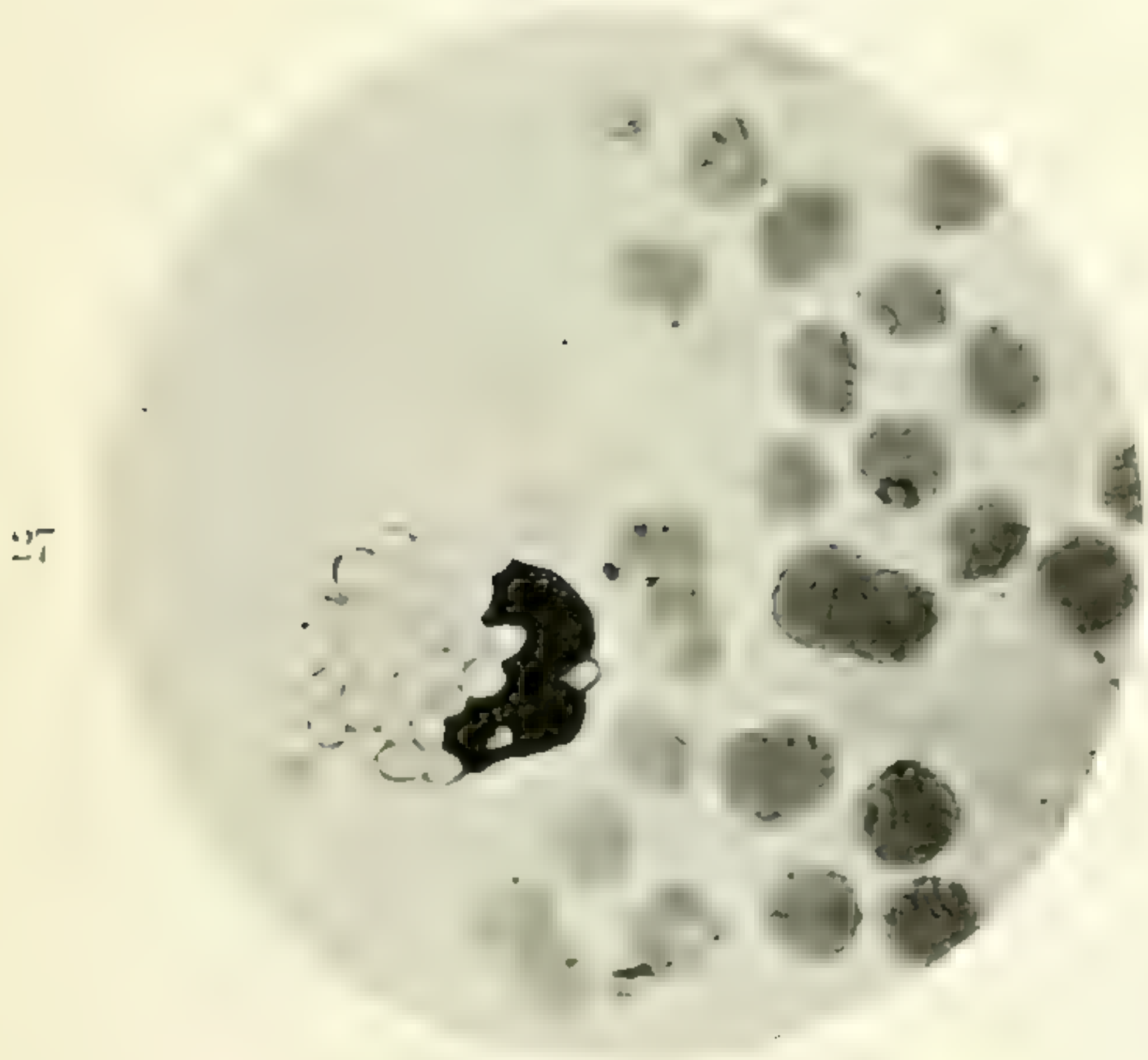
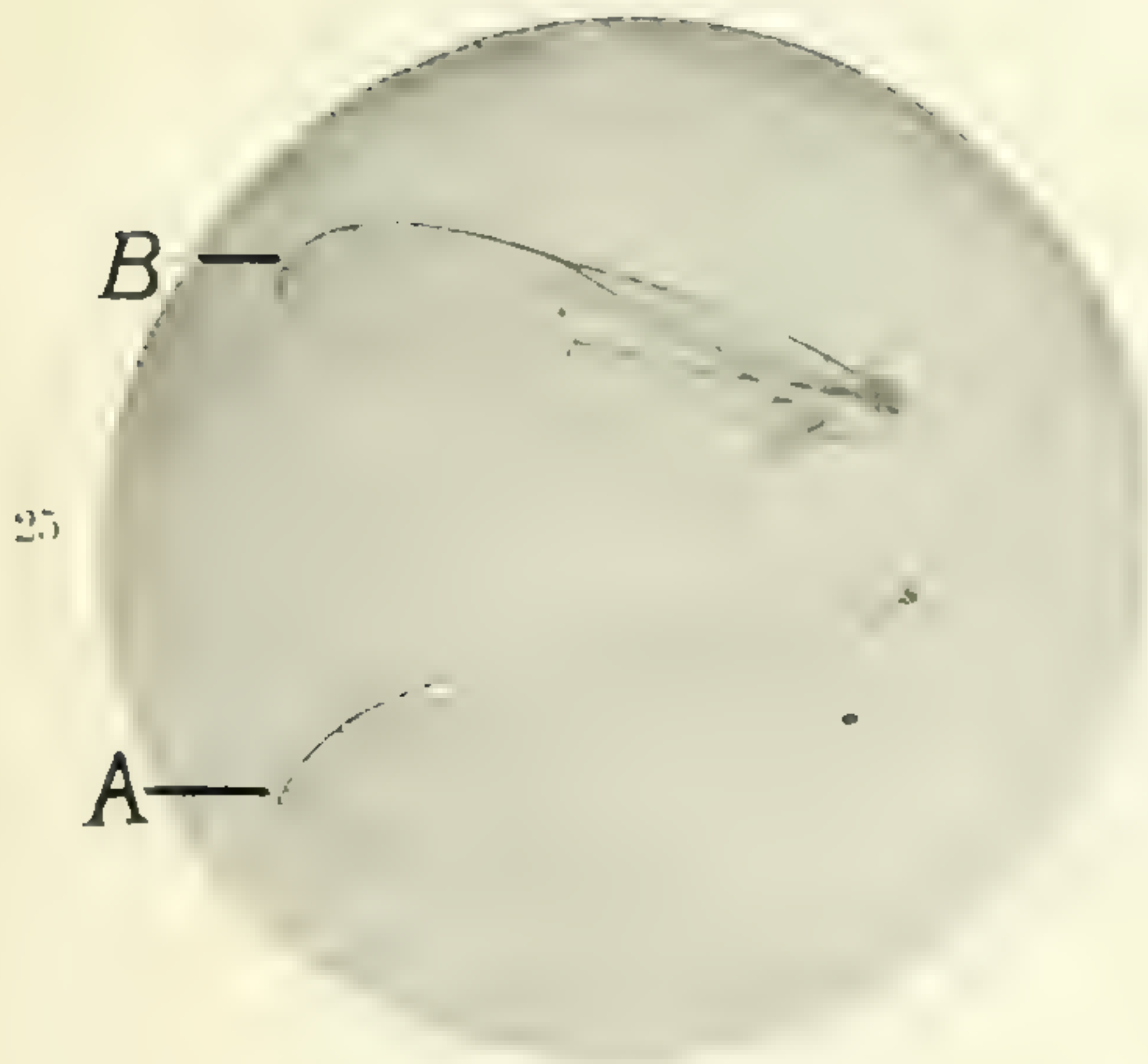


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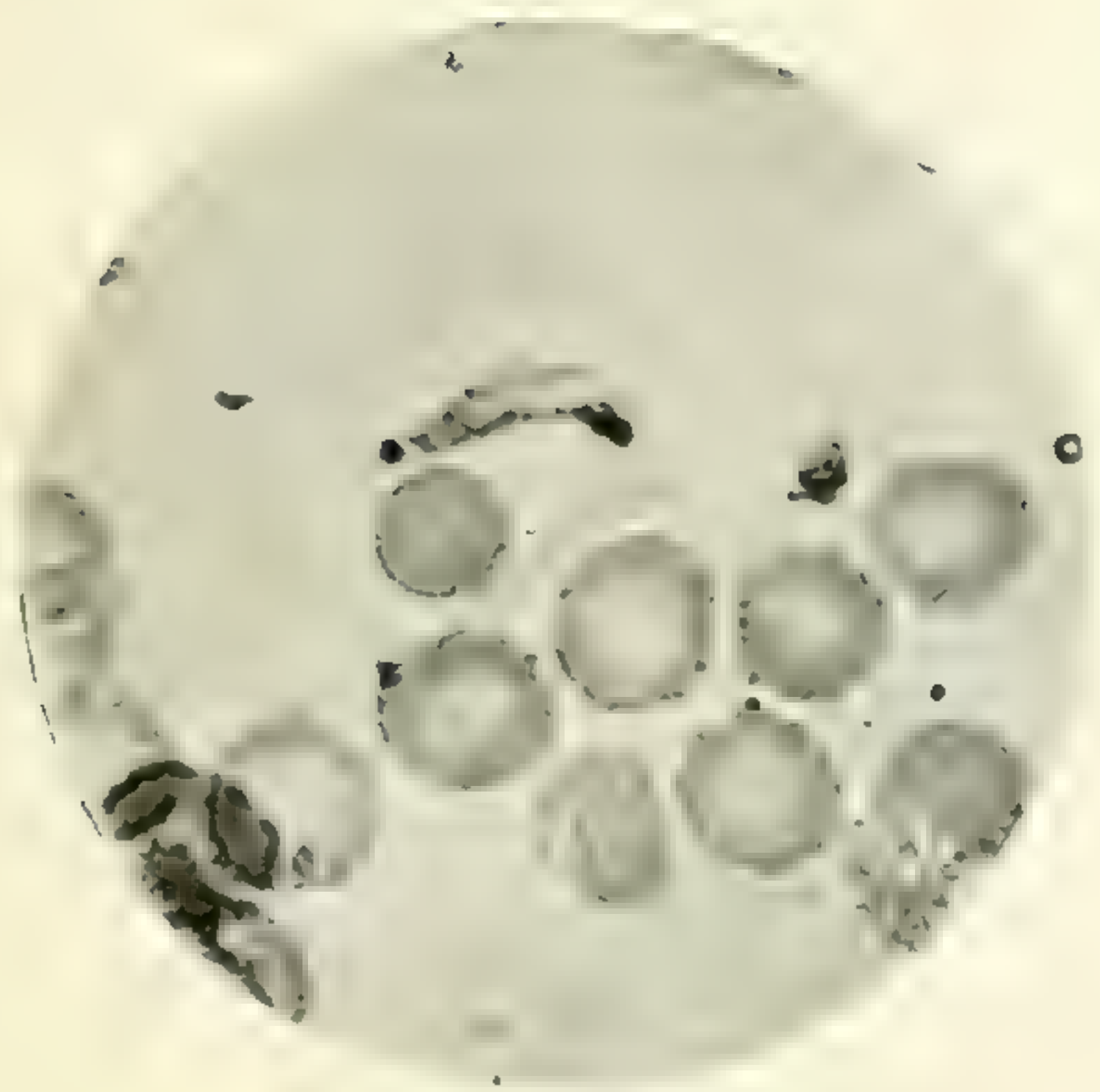
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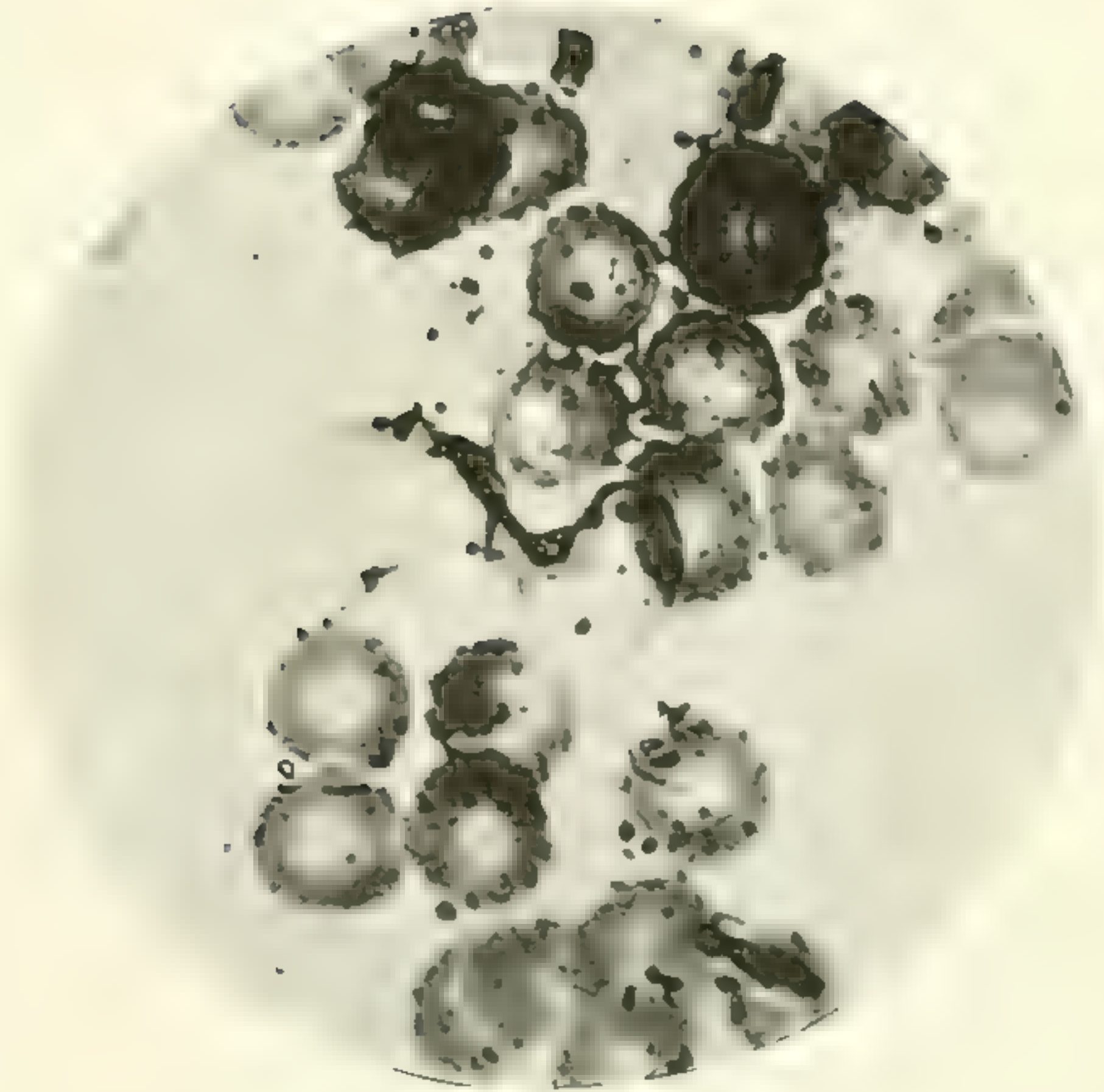




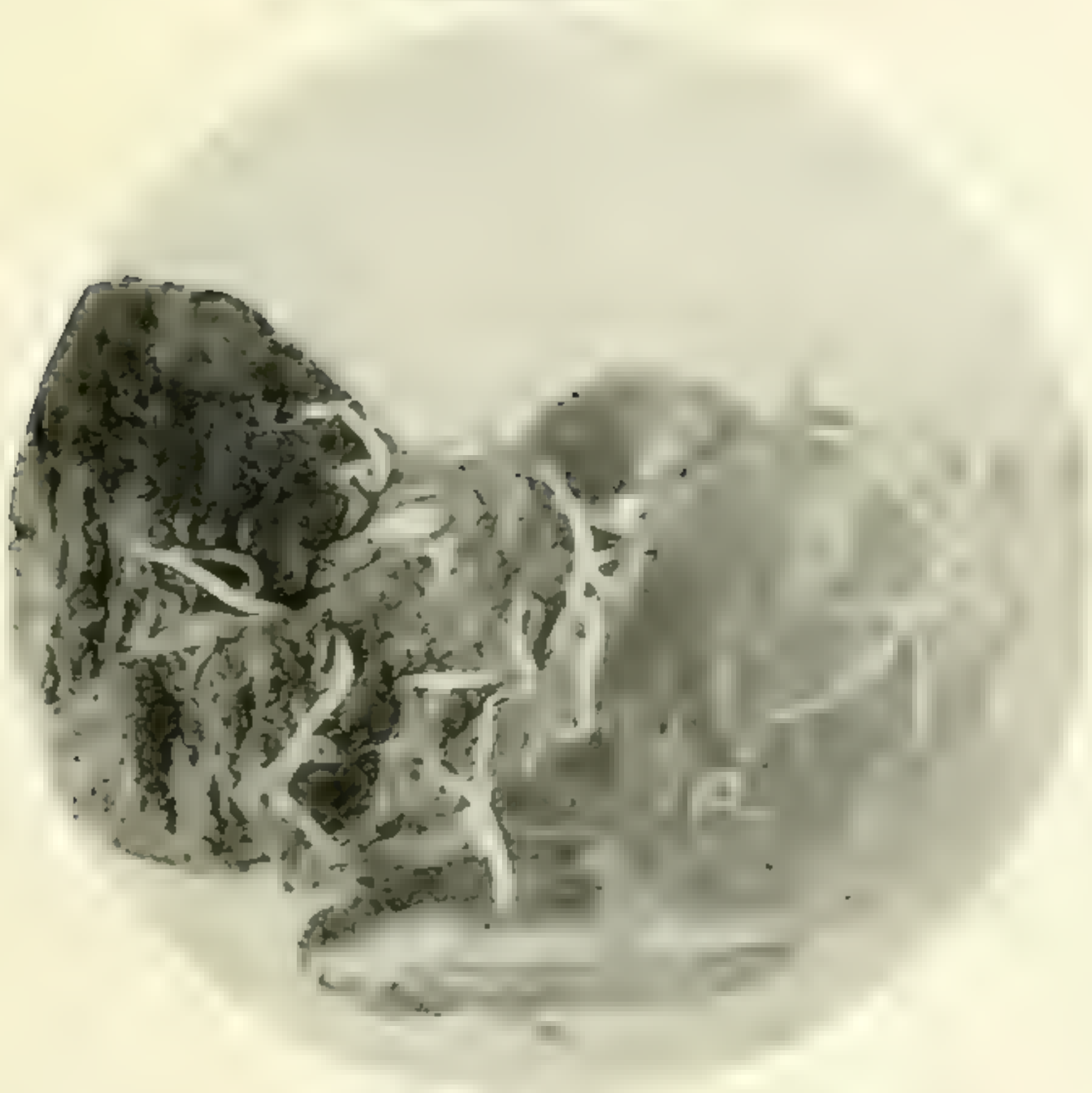
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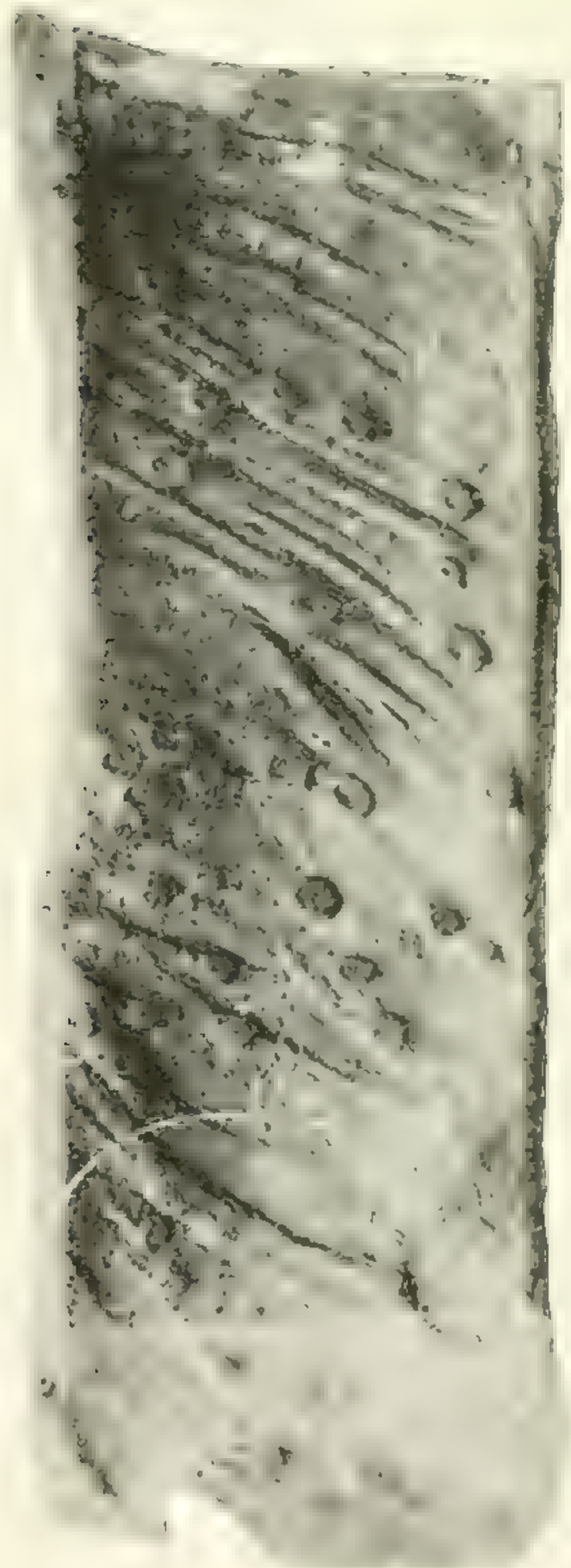
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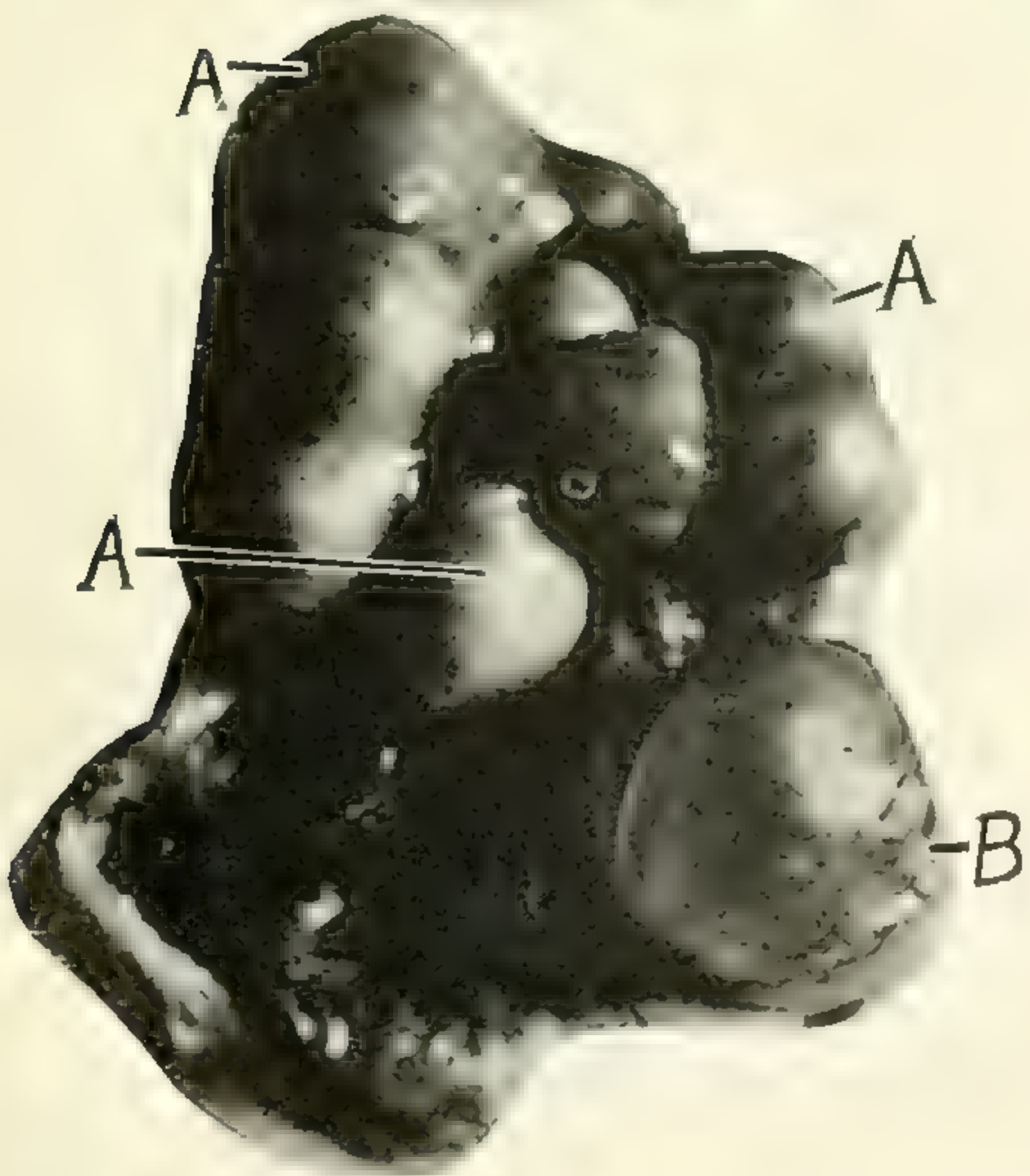
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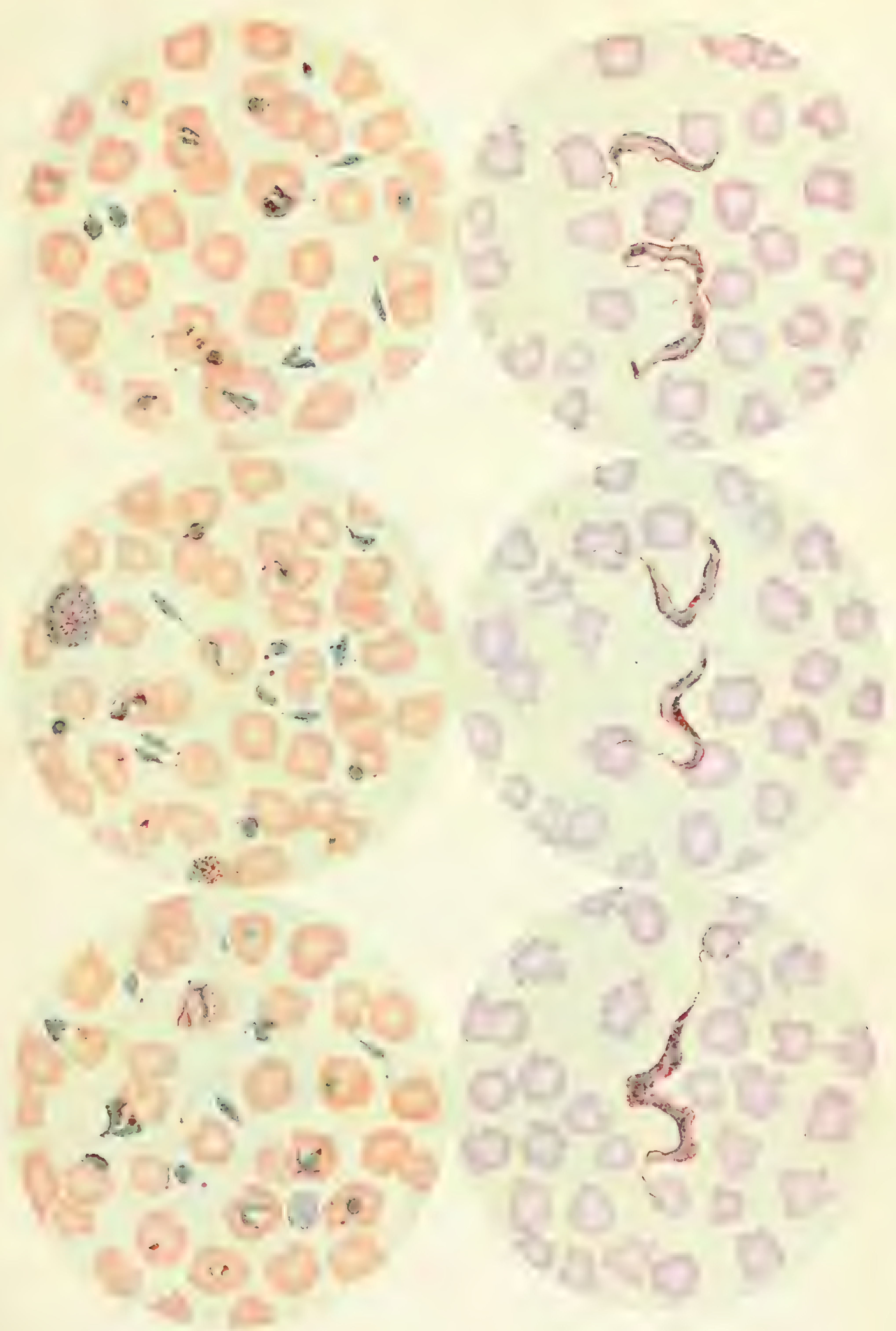


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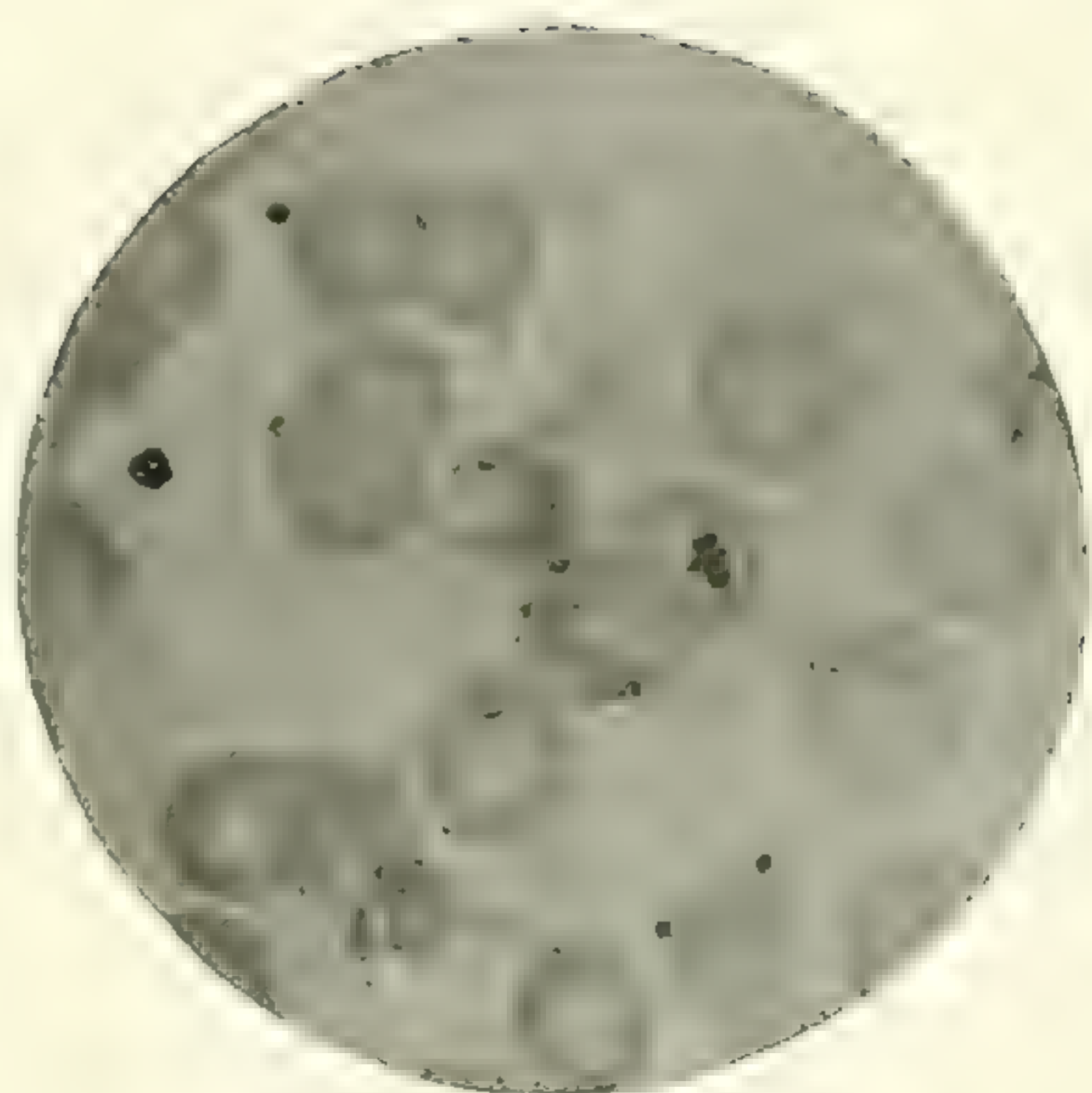




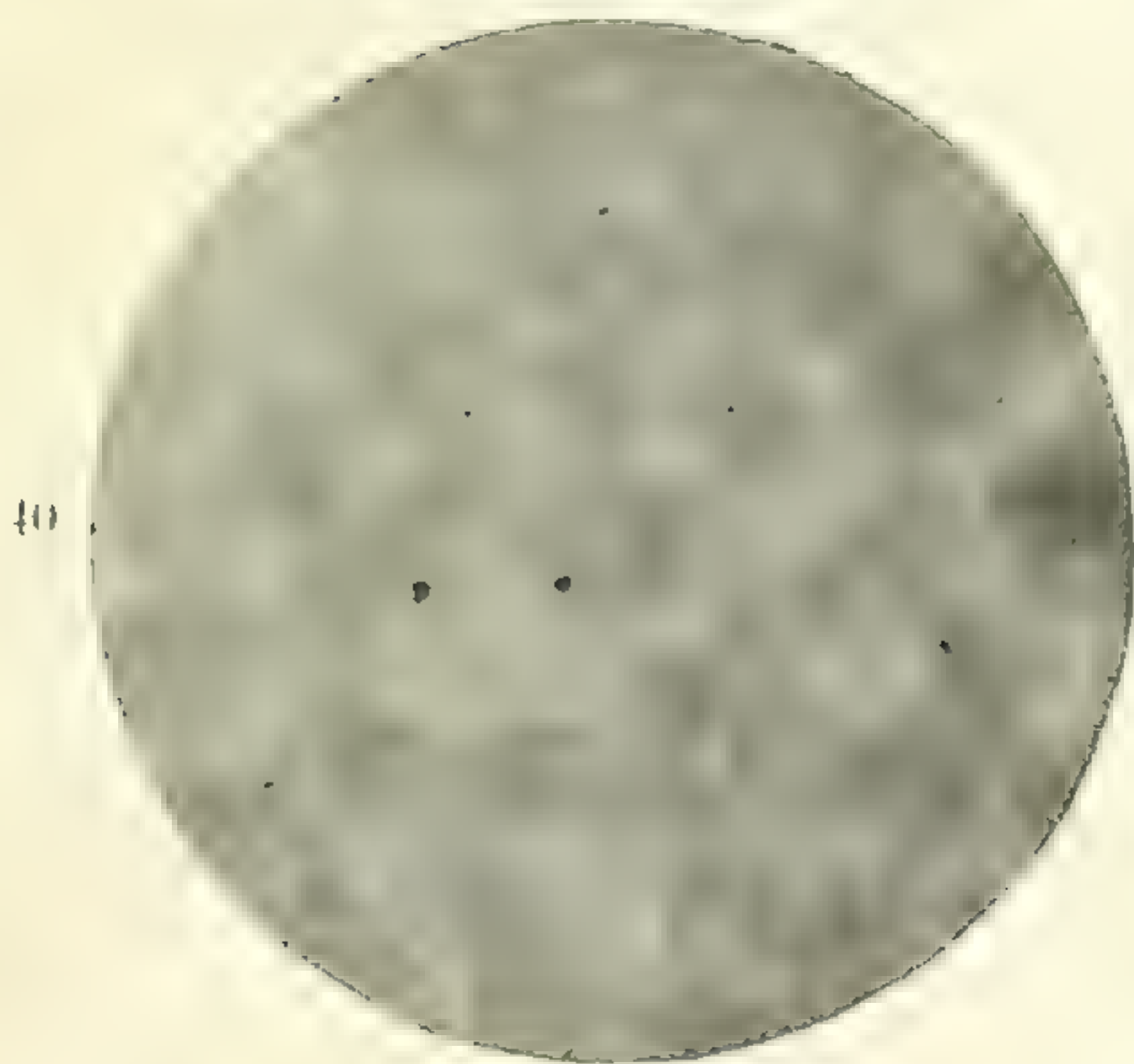




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